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UNDULANT FEVERS.

GILBERT (Ruth) & COLEMAN (Marion B.). **Recent Cases of Undulant Fever in New York State.**—*Jl. Infect. Dis.* 1928. Oct. Vol. 43. No. 4. pp. 273–279. [6 refs.] [New York State Dept. of Health, Albany.]

Two hundred and thirteen samples of blood serum were examined and sixteen were found to agglutinate *Br. abortus* in dilution of 1/40 or higher. Eight other similar cases were observed in a branch laboratory, and two cases of laboratory infection were met with, one due to *abortus* infection (wound of finger by broken pipette) and one to *melitensis* infection (sucked material into mouth from pipette). These 26 cases were carefully followed up and clinical histories are given. In none was there any history of contact with goats or pigs; raw cows' milk was used in 14 cases and *Br. abortus* was isolated from the milk supply; also the sera of the cows agglutinated the same organism.

The clinical history of the two laboratory-infected cases was interesting: the *abortus* infection was extremely mild and would have been missed had it not occurred in a laboratory worker who was known to have run an infected glass pipette into his finger; the case of laboratory infection by *melitensis* was, on the other hand, extremely severe.

The authors are of opinion that cases of undulant fever have been missed hitherto and give three reasons which they consider account for this: (1) Severe cases have in the past been called typhoid fever, tubercule, etc. (2) Mild cases have been overlooked or called influenza. (3) In some quite definite cases the serum of the patient does not agglutinate either *abortus* or *melitensis*.

D. Harvey.

HARDY (A. V.). **The Epidemiology of Undulant (Malta) Fever in Iowa. (Preliminary Report.)**—*Public Health Rep.* 1928. Sept. 21. Vol. 43. No. 38. pp. 2459–2469. With 1 text fig. [3 refs.]

In a previous paper it was shown that through the routine agglutination test with *Br. melitensis* var. *abortus* of all sera sent to the Health Laboratories, a number of cases of undulant fever were diagnosed. The present paper deals with the epidemiological side

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of the question. Consideration is first given to the accuracy of diagnosis and it is pointed out that all the cases were diagnosed clinically, bacteriologically and serologically.

As regards the clinical diagnosis, one symptom which was constant for all cases was weakness; the temperature was irregular and intermittent and only in less than one-third could it be described as truly undulant; yet other diseases could be excluded and the diagnosis may be considered as accurate.

As regards the serological diagnosis, no case was included which gave an agglutination titre less than 1/80 for *Br. melitensis* var. *abortus* and in nine cases a titre up to 1/5,000 dilution was obtained. Blood culture was successful in nine cases.

Of the 83 diagnosed cases, an epidemiological enquiry was made in 78. All but three occurred in one year—July, 1927, to June, 1928—and 30 of them were reported in April, May and June. They occurred sporadically and were widely scattered throughout the State; the distribution is shown in a spot-map. Forty-six of the patients lived on farms and 26 in the larger or smaller towns.

Occupation.—Thirty-nine were farmers, six were pork packers, ten were housewives not on farms, and the remainder were variously employed.

Sex.—Sixty-three males and 20 females; most of the cases were in the age group 20 to 49.

Source of Infection.—There is no evidence that infection was acquired from goats, sheep or horses. Very few goats are kept in the State and in only two cases was there even remote contact with goats; infection from that source could be excluded. In 52 cases the evidence indicated that infection was acquired from cattle. Illustrative cases are given showing that, in most, infection was due to consumption of raw milk from cows which had aborted; in a few, infection was due to actual contact with such animals. In another group of 11 cases, infection was probably acquired from hogs; there was evidence of repeated contact with infected hogs or pork, and in these, consumption of raw cow's milk was limited. The packing-house workers, six of whom developed fever, all used pasteurized milk. In one case the evidence strongly suggests that a wife who nursed her husband for two months during his illness, contracted the infection from him, as they lived in a large city and had no contact whatever with animals and drank pasteurized milk; the husband had contracted the disease while on a journey.

Mode of Transfer of infective material from animals to man.—In 25 cases in which there had been no contact with animals the evidence suggests that infection had been conveyed by raw milk or cream. In the case of the packing-house workers, infection probably resulted through direct infection of cuts on the fingers or hand when dealing with carcasses of hogs. From a study of statistical evidence it is clear that those exposed to actual contact with infected animals are more liable to acquire infection than those who only drink the milk of such animals. In such cases, *i.e.*, farm hands or veterinary surgeons who attend sick cattle, and in pork packers, undulant fever must be classed as an occupational disease; and the question of compensation has to be considered.

D. H.

DUNCAN (J. T.). **The Identification of *Brucella abortus* from Human Sources.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Nov. 25. Vol. 22. No. 3. pp. 269–280. With 4 figs. on 1 plate. [46 refs.] [London School of Hyg. & Trop. Med., London.]

This paper is a review of the literature concerning *Br. abortus* infections in man, with some original observations. [The writer, as well as POPPE (see below), fails to mention the observations by KENNEDY in 1914 in the *R.A.M.C. Journal*: that the milk and blood serum of London cows agglutinated *M. melitensis* in high dilution.]

The work of EVANS is discussed and it is pointed out that although the absorption test is a help in differentiating between *melitensis* and *abortus*, it is inadvisable that it should form the sole test employed.

On the question of morphology, it is noted that BRUCE originally called the organism discovered by him a coccus, whereas BANG called his a bacillus and this might be 3 μ in length. This differentiation still holds good in part: Duncan has found that if *Br. abortus* is planted out on some rich medium, such as Fildes medium, bacillary forms are obtained, whereas *melitensis* retains its coccal form; on reverting to ordinary agar, *abortus* reverts to coccal form; this process is well illustrated in the paper by microphotographs.

Another difference that has been noted is that some strains, especially bovine strains of *Br. abortus* isolated in America and in Europe, require a high concentration of CO_2 for initial growth, whereas *melitensis* and *abortus* strains of porcine origin and the Rhodesian bovine strains are capable of growth without the addition of CO_2.

The author has also found, as did HUDDLESON, that recently isolated strains of *Br. abortus* can be distinguished from *melitensis* by their power of liberating hydrogen sulphide when grown in capped tubes and on rich media containing organic sulphur.

The author considers that agglutination and absorption tests alone are not sufficient to distinguish between *abortus* and *melitensis*, nor can different strains of *abortus* be distinguished by this means.

The difference in pathogenicity for guineapigs may also be used to differentiate between porcine and bovine *abortus* (Theobald SMITH).

The author then discusses the various recent reports of infection of man with *abortus* and remarks that in many instances the particular organism was either not isolated at all or that when isolated it appeared to grow freely in ordinary culture and was only identified by absorption agglutination tests.

The recent Italian cases are discussed, and it is pointed out that although the majority of these were due to infection from a cow with contagious abortion, the Italians favour the view that this may be due to a *melitensis* strain.

In Rhodesia, goats as a source of infection may be entirely excluded, also hogs, and this leaves only contagious abortion in cattle, which is common in that country.

Duncan has investigated a strain sent from Rhodesia isolated from a case of undulant fever in man and found that it resembled *abortus* in its agglutination reactions and in its ability to produce hydrogen sulphide, and when cultivated for 24 hours on peptic digest blood agar it developed the long bacillary forms characteristic of *abortus* strains, and when cultivated on glucose agar it reverted to the coccal shape. The strain was, therefore, identified as *Br. abortus*.

The fact that Rhodesian *abortus* strains when freshly isolated are "free growing," i.e., do not require additional CO_2, differentiates

them from the European and American strains and would suggest that, as BEVAN has said, "the *Br. abortus* of Rhodesia is a native variety."

The author concludes that the recent discovery in so many different countries of cases of undulant fever, which, in the majority of cases, can be traced to infection from milch cows, raises questions of great economic importance and renders very necessary a more complete study of the organisms isolated from man in the new areas of the disease.

D. H.

POPPE (K.). Die Bang-Infektion des Menschen. [**Abortus Infection in Man.**]—*Deut. Tierärzt. Woch.* 1928. Nov. 24. Vol. 36. No. 47. pp. 781–786. With 2 charts. [75 refs.]

This paper consists of a very thorough and complete survey of the literature concerning the infection of man by *Br. abortus*, both historical and comparative. [It is interesting in this connexion that so few of these reviews mention the observation by KENNEDY of agglutinins for *M. melitensis* in the milk and serum of cows in England in 1913–14.]*

The author also gives two interesting tables which show the agglutination reactions of seven cases of *abortus* infection investigated by him in the University Clinic in Rostock. Four hundred and fifty-four sera were examined and of these, seven were found to agglutinate *Br. abortus* in dilution between 1/200 and 1/6,400; in one case, also, blood culture was positive. Agglutination for typhoid was not present and the cases were clinically typical. The infection was, as elsewhere, traced to consumption of raw milk in all but one, and this patient had been employed in the care of a cow with contagious abortion.

The second table gives a comparison between the agglutination reactions of the patients and the agglutinations of the serum of the suspected cows, all of which were positive and closely parallel to the results of the human sera. Three strains of *Brucella* were used, one *melitensis* and two *abortus*, one of human origin and one bovine; no difference was noted in the titres of agglutination.

The remainder of the paper deals with the literature concerning the clinical aspect of the disease in man, with its treatment and its prophylaxis. In this last connexion pasteurization of milk and personal prophylaxis of veterinary workers and farm hands is recommended.

D. H.

VAN DER HOEDEN (J.). Het besmettelijk verwerpen der runderen in verband met ziekten van den mensch. [**Contagious Abortion of Cattle and Human Disease.**]—*Tijdschr. v. Diergeneesk.* 1928. Nov. 1. Vol. 55. No. 21. pp. 1065–1079. [31 refs.] English summary pp. 1079–1080.

The author asks the question: on what grounds can we say that *Br. abortus* (Bang) is pathogenic for man? He considers that the experiments of NICOLLE and BURNET lack force in that they were carried out with old laboratory cultures. [In a later research NICOLLE

* *Journal of Royal Army Med. Corps*, 1914, Vol. 22, p. 9. Cf. this *Bulletin*, Vol. 3, p. 214.

and BURNET repeated their experiments and inoculated volunteers with fresh cultures of *abortus* without producing any infection.] It is obvious, in view of the many sources of infection in herds of cattle and the few cases reported in man, that *abortus* is but slightly pathogenic for man; and BASTAI'S suggestion, that infections derived from aborting cows may be due to *melitensis*, is ruled out in such countries as Holland where Malta fever, i.e., *melitensis* fever, in man has never been recorded.

In the Central Laboratory in Holland, 17 cases of *abortus* infection in man have been discovered since December, 1927; in one case the bacillus was isolated from the blood and on inoculation into a healthy heifer produced abortion although the calf was born alive. The serum of the calf at birth gave a negative agglutination reaction, whereas the serum of the cow reacted up to a dilution of 1/25,000 with *Br. abortus*; later on the serum of the calf also reacted. Seven of the 17 cases were infected by drinking raw milk and five by direct infection from aborting cows.

The author considers that, previously, many cases of this fever in man had been overlooked, although it is possible that a strain of increased virulence has been produced.

In 10 of 24 samples of milk in the province of Utrecht *Br. abortus* was recovered by inoculation of guineapigs.

For preventive measures, the author suggests:—

(1) Antiseptic precautions for those who are compelled to treat sick cows; rubber gloves, etc.

(2) Boiling or pasteurization of milk. D. H.

SEELEMANN (M.) & HADENFELDT (A.). Ueber das Vorkommen von Banginfektionen beim Menschen. Uebersichtsreferat. **Occurrence of Abortus Infection in Man: General Review.**—*Ztschr. f. Fleisch- u. Milchhygiene.* 1928. Nov. 1. Vol. 39. No. 3. pp. 45–51. [46 refs.] [Prussian Exper. Research Inst. for Milk Economics, Kiel.]

The authors point out that although undoubted infections of man by *Br. abortus* have been reported, and also occasional but not nearly so numerous infections in women, yet *Br. abortus* as a cause of abortion in women has not so far been proved.

They then review the recent German literature on the subject and point out the difference in infection caused on the one hand by wound infection and on the other by the ingestion of raw cows' milk.

Various papers by American, Dutch, Italian and British authors are also referred to; these papers have already been reviewed in this *Bulletin.*

The conclusions of the authors are that infection of man by *Br. abortus* in cows' milk is now proved and that therefore careful pasteurization of the milk supply is more than ever necessary.

D. H.

BURNET (Et.). Sur le pouvoir pathogène du *M. melitensis* et du *B. abortus* pour le singe et l'homme. [**Pathogenicity of** *Br. melitensis* **and** *abortus* **for Monkey and Man.**]—*C.R. Acad. Sci.* 1928. Sept. 24. Vol. 187. No. 13. pp. 545–548. [1 ref.]

Five years ago the author showed by experiment that *Br. abortus* of bovine origin was non-pathogenic for man and monkey, and also

that man and monkey inoculated with *Br. abortus* vaccine were immune to inoculation with *Br. melitensis.* Objection was made to these experiments on the ground that they were carried out with cultures which had been long subcultured in the laboratory. In view of these objections, and also because cases of undulant fever in man due to infection from cattle suffering from contagious abortion have recently been reported from many countries, the author has repeated his experiments using fresh cultures. The results obtained were exactly in agreement with the previous experiments, except that in one instance, in a monkey, there was slight illness and *Br. abortus* was recovered from the blood. Three men inoculated under the skin with doses of 200,000,000 *Br. abortus* did not develop any fever and had no symptoms whatever, also they were resistant to subsequent inoculation with *Br. melitensis,* whereas a control volunteer contracted undulant fever.

The author considers that *Br. abortus* is only slightly or rarely pathogenic for man or else there are special races of *Br. abortus* which are capable of producing both abortion in cattle and fever in man. Another suggestion is that infection of cattle with *Br. melitensis* has become widespread and this organism is capable of producing abortion in cattle and undulant fever in man.

D. H.

SARTORI (Carlo). Distribuzione e frequenza della febbre di Malta in provincia di Bologna. [**Distribution and Prevalence of Undulant Fever in Bologna.**]—*Arch. Ital. Sci. Med. Colon.* 1928. Jan. Vol. 9. No. 1. pp. 22–38. With 1 map in text. [Inst. of Trop. Path., Univ. Bologna.]

A large part of this article is occupied with a description of the *Br. melitensis* and its characters. The remainder gives a brief account of the distribution of undulant fever in the Province of Bologna with a spot-map showing the disease to be fairly general. Of purely local interest.

H. Harold Scott.

BURNET (Et.). Modifications biochimiques imprimées aux cultures de *B. abortus* en vue de la prémunition contre la fièvre ondulante. [**Biochemical Changes impressed on Cultures of** *Br. abortus* **with a view to Vaccination against Undulant Fever.**]—*C.R. Acad. Sci.* 1928. Oct. 8. Vol. 187. No. 15. pp. 618–620. [1 ref.]

The author points out that according to the results of his experimental work *Br. abortus* is but slightly pathogenic for man and that small doses of this bacillus can protect man and monkey from *Br. melitensis* infection; he therefore suggests the use of a vaccine of *Br. abortus* for the general protection of man and goats. As a preliminary research he has attempted to attenuate the coccus by growing it in bile broth. He compared such strains with strains which had not been so treated and found that on inoculation into guineapigs the bile-treated strains had lost practically all their virulence as compared with the untreated strains. He therefore suggests the use of such modified strains as a living vaccine for the protection of goats and man.

D. H.

SANFILIPPO (E.) & MIGNECO (G.). Untersuchungen ueber Immunisierung gegen Mittelmeerfieber. II. Mitteilung. Ueber die Infektion der weissen Ratte. [**Researches on Immunization of White Rats against Undulant Fever.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1928. Vol. 58. No. 5-6. pp. 389–399. [12 refs.] [Med. Clinic, Univ., Catania.]

The authors point out that the pathogenicity of *Br. melitensis* for laboratory animals, e.g., rats, has not been clearly worked out and such reports as are available are not in agreement. They therefore have carried out a large series of experiments on white rats using cultures of this coccus.

In one point they confirm the work of previous investigators, and that is, that it is extremely difficult to produce agglutinins to *Br. melitensis* in the blood of rats. The first table shows the results of intraperitoneal injections of large doses of living *Br. melitensis*. The virulence of the culture was maintained by rat passage, and was such that half of the growth of a 48-hour culture on agar killed a rat of 90 gm. in 24 to 48 hours. The washings of such a growth suspended in normal saline were injected intraperitoneally into white rats in doses from 0·1 cc. to 0·5 cc. In doses less than 0·5 cc. the rats showed transient illness and subsequently recovered, and when killed 20 days later no signs of infection could be found and it was not possible to recover the coccus from the organs; but in doses of .0·5 cc. severe illness developed and the animals died in 24 to 48 hours, although in a few cases death was postponed until the fourth day. Agglutination tests were negative. At post-mortem the micrococcus was obtained in pure culture and the organs showed the characteristic pathological anatomical signs of a septicaemia. In one rat a bilateral orchitis was noticed.

A further series of experiments were carried out to determine how many days it takes for rats infected with a sublethal dose to clear themselves of the germ. As early as the sixth day no germs could be detected, but after the injection of larger doses (up to 0·4 cc.) positive cultures were obtained up to the twelfth day.

In order, if possible, to produce a prolonged illness in rats comparable to the disease in man two methods were adopted: (1) inoculation with micrococci attentuated by exposure to heat at 55° C.; (2) rats which had been previously partially immunized with doses of cocci killed by means of gold chloride were subsequently inoculated with large doses of living cocci. Such animals showed a severe illness for a time, six to ten days, and then apparently completely recovered. Death, however, may occur suddenly even several weeks later. The rats were killed from one to three months after the illness and on examination the coccus could still be recovered from the lymph glands, spleen and bone-marrow. In three of the rats small abscesses were noted in the liver and *Br. melitensis* was recovered from the pus in pure culture in one case and mixed with other organisms in the other two.

D. H.

CAZALAS (Xavier). Un cas de fièvre ondulante. Valeur thérapeutique de la Mélitine de Burnet. [**Case of Undulant Fever. Therapeutic Value of Melitine.**]—*Paris Méd.* 1928. Aug. 25. Vol. 18. No. 34. pp. 161–166. With 1 curve.

The author rightly states that so many cases of undulant fever due to *Br. melitensis* or *Br. abortus* have been recently described, that to

describe another single case seems unnecessary, but his excuse is that he wishes to draw attention to the excellent results obtained by the therapeutic use of intradermal and intramuscular injections of melitine which he obtained from Dr. BURNET.

The case was that of a native soldier, whose fever had lasted for some six months before a diagnosis of undulant fever was made. The explanation given is twofold: (1) That the fever was not undulant, but frankly remittent; (2) that on three occasions blood cultures were taken and all were returned as sterile. The failure to obtain a positive blood culture is attributed to the fact that the cultures were only retained in incubation for 12 days. A fourth blood culture taken late in the disease was kept for one month and on the 26th day became positive. As soon as the diagnosis was confirmed, melitine, prepared locally, by filtering 12 days broth cultures of melitensis, was administered intradermally and gave positive reactions, but had no effect on the temperature. However, when some melitine, prepared by Dr. BURNET, was received and four doses of this were given, the temperature fell to normal and remained so, and the patient made a good recovery.

The weak point in the case is, as the writer himself points out, that before melitine was administered the man had already had nearly eight months' fever and therefore may have made a spontaneous recovery. The fact that the locally-prepared melitine given a few days earlier had no effect would seem to support this conclusion.

The author wishes to emphasize three points.

1. Undulant fever may be a misnomer.
2. In any prolonged remittent fever blood cultures should be made and kept at least one month in the incubator before being dismissed as sterile.
3. Try the therapeutic effect of melitine early in undulant fever intradermally and intramuscularly, the dose for the latter route being 0·5 cc.

D. H.

DARRÉ (H.) & LAFFAILLE (A.). Un cas de fièvre de Malte guéri par les injections intraveineuses de trypaflavine. [**Case of Undulant Fever cured by Intravenous Injections of Trypaflavine.**]—*Bull. Acad. Méd.* 1928. Oct. 16. Year 92. 3rd Ser. Vol. 100. No. 34. pp. 999–1003. With 1 chart.

This paper describes the treatment, by means of trypaflavine, of a case of undulant fever diagnosed by positive blood culture. The fever had already lasted for 2 months in spite of injections of melitine, and, as far as could be deduced from the condition of the patient, it might have continued for much longer. A dose of 0·10 gm. of trypaflavine was given intravenously without effect, but on the administration of a dose of 0·20 gm. the fever fell by crisis and remained normal for several days, when there was a relapse; a second dose of 0·20 gm. was then given and the temperature fell to normal next day, remained normal, and the patient quickly convalesced. The authors strongly recommend a trial of this drug in the treatment of undulant fever, and suggest that even larger doses, 0·4 gm., may be given.

D. H.

PODDIGHE (Antonio). Setticemia emorragica da melitense. [**Haemorrhagic Forms of Undulant Fever.**]—*Policlinico.* Sez. Prat. 1929. Jan. 28. Vol. 36. No. 4. pp. 122–125.

Three interesting cases are recorded. All were proved to be undulant fever by positive haemoculture.

In the first, on the ninth day of illness, there was profuse haematuria and blood continued to be present for forty days; the fever continued

on and off for five months. The second showed marked pulmonary symptoms and in the second week haemoptysis with clots of blood in the sputum was present. Soon after, livid dark-brown patches of cutaneous haemorrhages appeared, in size up to that of the palm of the hand, and distributed generally over the body. The fever in this patient was of a continued remittent type lasting for 30 days. The third had a similarly sudden onset, but on the fifteenth day developed signs of pleuritic effusion, and exploration withdrew haemorrhagic fluid ; on the next day there were indications of abdominal effusion, and paracentesis here also showed a dark blood-stained fluid. On the same day four or five small subcutaneous ecchymoses appeared. Recovery was prolonged; in fact, cure was not complete for many months.

H. Harold Scott.

Doria (Raimondo). Sopra un caso d'infezione da bacillo di Bang nell' uomo. [**A Case of Human Infection by** *Br. abortus*.]—*Policlinico.* Sez. Prat. 1928. Dec. 3. Vol. 35. No. 48. pp. 2385–2386 ; 2389. [6 refs.]

The patient, a man of 22 years, suffered from periodic attacks of fever each lasting one to two weeks with several days' intermission. He had lived in a district where an epizootic of abortion in cows prevailed. His serum agglutinated *Br. melitensis* 1 : 300 at room temperature, and after heating to 56° C., but was negative after heating to 65° C. ; with *Br. abortus* agglutination occurred in a dilution of 1 : 800 and after heating to 65° C. in 1 : 400. Treatment with *melitensis* vaccine brought no benefit. The diagnosis is based on the history and these serological results.

H. Harold Scott.

Parker (William G.). **A Case of** *Bacillus abortus* **Infection.**—*Jl. Amer. Med. Assoc.* 1928. Oct. 27. Vol. 91. No. 17. p. 1289.

This is a report of a mild case of undulant fever in a farmer aged 29. Blood culture and agglutination test were both positive for *Br. abortus*. It was considered that infection was contracted by drinking the raw milk of a cow which had aborted about two months previously. The fever only lasted one month and the author considers that the therapeutic use of metaphen aided recovery.

D. H.

Vidal (Joseph) & Abella (Rosendo). La différenciation du *Micrococcus melitensis* et du bacille de Bang per les agglutinines. [**Differentiation of** *Br. melitensis* **and** *abortus* **by Agglutinins.**]—*C.R. Soc. Biol.* 1928. Oct. 26. Vol. 99. No. 29. pp. 1271–1273. [3 refs.] [Municipal Bact. Lab., Barcelona.]

The authors tested various types of emulsions of *Br. abortus* and *Br. melitensis* against the serum of a cow that had recently aborted. The emulsions were either treated with bile or heated, or were normal emulsions. They could not find any notable difference in the results obtained. Two goats were inoculated with living emulsions of *Br. abortus* ; 18 days later they were bled and the sera tested for agglutinins. The results were interesting. The serum of No. 1 goat agglutinated emulsions of *Br. melitensis*, both bile-treated and normal, in higher titre than it did emulsions of *Br. abortus*. The serum of goat No. 2 agglutinated best the bile-treated emulsions of *Br. melitensis* and, in lower titre, but all equal, the normal emulsions of *Br. abortus* and *melitensis* and the bile-treated emulsions of abortus.

They therefore decided that nothing was to be gained by using bile-treated emulsions and in their further work employed normal emulsions suspended in saline.

They examined the sera of 256 cattle which had been killed in the slaughter-house and, of these 90 agglutinated *Br. abortus* at or above a dilution of 1/200.

TABLE.

Sera analysed	256
Positive for *melitensis* and *abortus* in titre above 1/200	90
Number of infected cattle	35
Sera agglutinating *abortus* and *melitensis* equally	41
Sera agglutinating *melitensis* in higher titre	11
Sera agglutinating *abortus* in higher titre	16
Sera agglutinating only *melitensis*	11
Sera agglutinating only *abortus*	11

The authors conclude that it is not possible to separate *abortus* from *melitensis* by agglutination tests and bile-treated or heated emulsions are of no assistance for this purpose.

D. H.

VIDAL (J.). Sur la différenciation du *Micrococcus melitensis* et du *Bacillus abortus* par des substances chimiques. [**Differentiation of *Br. melitensis* and *abortus* by Chemical Substances.**]—*C.R. Soc. Biol.* 1928. Oct. 26. Vol. 99. No. 29. pp. 1279–1280. [1 ref.] [Municipal Bact. Lab., Barcelona.]

Certain writers have suggested that agglutination by chemical solutions may be utilized to separate *Br. melitensis* from *Br. abortus*. A 1 per cent. solution of lactic acid has been used and has been stated to agglutinate *melitensis* and not *abortus*. Vidal tried this out. He used 17 strains of *melitensis* and six of *abortus*. Ten of the *melitensis* strains were agglutinated and seven were not ; whereas, all the *abortus* strains were agglutinated by the lactic acid solution. He suggests that possibly the discrepancy may be due to difference in the medium in which the organisms were grown. He therefore prepared an apparatus by means of which he grew *abortus* and *melitensis* in the same sample of broth but separated by a filter candle. After one month of this symbiosis six of the strains of *melitensis* which had previously been inagglutinable by lactic acid were now agglutinated and one strain still remained as before. The author concludes that acid agglutination is of no assistance in differentiating *abortus* strains from *melitensis*.

D. H.

BOAK (Ruth) & CARPENTER (C. M.). **The Thermal Death Point of *Brucella abortus* in Milk.**—*Jl. Infect Dis.* 1928. Oct. Vol. 43. No. 4. pp. 327–329. [6 refs.] [New York State Vet. College, Cornell Univ., Ithaca.]

Owing to the difficulty of obtaining cultures of *Br. abortus* from milk, previous reports regarding the thermal death point have been scanty and contradictory. It has been stated that the organism is killed by exposure to 55° C. for two hours, at 60° C. for ten minutes and at 65° C. for five minutes. More recently PARK has found that a temperature of 140° F. for ten minutes was sufficient to sterilize an emulsion containing 5,000 million per cc. of the organism. At 145° F.

only five minutes' exposure was necessary. The author of the paper under review used eight strains of Brucella ; four derived from cows' milk, three from human cases of the disease, and one porcine strain. The method used was to inoculate tubes of whole milk with the strain, to incubate for 48 hours and then fill into glass bulbs, which were sealed and completely submerged in the water-bath. The temperatures employed were 140° F., 142° F., and 145° F., and the times 5, 10, 15 and 20 minutes. The bulbs were then removed from the water, quickly cooled and opened, and tubes of soft agar inoculated and incubated. The remainder of the milk was then inoculated intraperitoneally into guineapigs.

It was found that the porcine strain was most resistant to heat, being still alive after 15 minutes at 140° F., but it was no longer grown after 20 minutes' exposure at the same temperature, and also was killed by an exposure of 5 minutes at 145° F. The other strains were all killed at 140° F. after 15 minutes' exposure and an exposure for 1 minute at 160° F. killed all the strains.

D. H.

Brugi (Antonio). La glicemia nella infezione melitense. [**Glycaemia in Undulant Fever.**]—*Riforma Med.* 1928. Oct. 8. Vol. 44. No. 41. pp. 1305–1308. With 2 graphs. [37 refs.] [Inst. of Med. Clin., Univ., Pisa.]

The author estimated the sugar in the blood, free and combined, the former by Bang's method, the latter by that of Condorelli, in 19 cases of undulant fever. Five of these were severe, seven of average severity, and seven mild, all proved by haemoculture and by agglutination. He divided the investigations into three groups according to the stage of the disease : (1) in the febrile period ; (2) in the early afebrile, that is the first 10 days ; (3) in the permanent afebrile period, after 20 days' apyrexia when convalescence had set in.

In the first he found a constant increase of the blood-sugar, both fasting and after ingestion of glucose, 150 gm. in 200 cc. water, in the second a diminution and in the third the figures fell to normal. The changes are ascribed to the glycogenic and glycoregulating functions of the liver. At no time was any glycosuria discovered. The detailed figures on which the above statements are based are presented in tabular form.

H. Harold Scott.

DENGUE AND PAPPATACI FEVER.

League of Nations Monthly Epidemiological Report. 1928. Sept. 15. Vol. 7. No. 9. pp. 335–338. [2 refs.]—**The Dengue Epidemic in Greece.**

Dengue is usually a mild disease and therefore is not notifiable. Thus, the sudden outbreak in 1928 in Athens and Piraeus took the authorities by surprise. The population of these places has increased enormously in the last few years due largely to the influx of refugees, and the sanitary arrangements have not kept pace with the new situation. The result has been that very numerous breeding places have been produced for *Aedes aëgypti* and this pest is found at certain seasons of the year in enormous numbers.

The development of the epidemic is shown by the number of deaths attributed to dengue in Athens.

	Deaths.		Deaths.
August 1st to 5th ...	9	August 16th to 20th ...	92
,, 6th ,, 10th ...	18	,, 21st ,, 25th ...	141
,, 11th ,, 15th ...	27	,, 26th ,, 30th ...	103

In Piraeus 118 deaths from dengue occurred in the last ten days of August, 1928.

It is believed that there were 239,000 cases of dengue in Athens alone up to September 4th, and it is estimated that in the long run nearly 90 per cent. of the population of Athens and Piraeus have been ill from dengue.

Numerous cases were also reported from the Islands of the Grecian Archipelago. Although a considerable number of cases were mild and transient, the type was severe in the majority of cases and nervous symptoms appear to have been predominant.

D. Harvey.

Copanaris (Phocion). L'épidémie de dengue en Grèce au cours de l'été 1928. [**The Epidemic of Dengue in Greece during the Summer of 1928.**]—*Bull. Office Internat. d' Hyg. Publique.* 1928. Oct. Vol. 20. No. 10. pp. 1590–1601. With 1 map in text.

The author is of opinion that the very severe and extensive epidemic of dengue in Greece in 1928 was a sequela of the mild epidemic of the same disease in 1927, the infection being carried over the winter in hibernating mosquitoes. The two epidemics broke out in the same quarter of the city of Athens, and at about the same time of the year, i.e., the first 10 days of July. As in 1927 so in 1928, the early cases were mild and the diagnosis was missed, with the result that many mosquitoes became infected and there was an explosive outbreak which spread throughout the city, culminating in the second half of August. It was noted that persons who had had the disease in 1927 escaped in 1928; presumably some immunity had been produced and remained.

It was noted that in the summer of 1928 there was a remarkable increase in the number of Stegomyia and that in the houses where there were most mosquitoes, there was also most dengue.

Clinically at first, in 1928, the cases resembled those seen in previous years, but in August graver forms appeared and many deaths were reported, especially in old people.

Post mortem there was not much to be noted; the spleen was not enlarged except in old malarial subjects; the liver, however, was enlarged and the kidneys showed parenchymatous changes; the heart muscle also was degenerated as the result of a toxaemia; there was congestion of the alimentary canal and small haemorrhages were noted in the mucous membrane of the stomach.

Laboratory Research.—A leucopenia with relative lymphocytosis was noted. Investigations for the discovery of a spirochaete such as that described by Couvy were entirely negative.

The fact that the disease can be conveyed to healthy susceptible people by means of inoculations of the whole blood or serum from cases of the disease, was confirmed as also was the transmission by the bite of mosquitoes.

Treatment.—Copious acid drinks, milk diet, and symptomatic treatment.

Prophylaxis.—If the first cases of an outbreak could be detected and isolated under nets or in screened wards the epidemic would be arrested. The destruction of all breeding places for Stegomyia is extremely difficult and can only be done over a period of years: orders have now been issued regarding the necessary precautions.

D. H.

Sarcorrafos (M.). Estudio clinico sobre el dengue. [**Dengue: a Clinical Study.**]—*Siglo Méd.* 1928. Oct. 20. Year 75. Vol. 82. No. 3906. pp. 376–378.

An interesting account of the outbreak in Greece by the Professor of Clinical Medicine at Athens. He shows that the disease in some cases presented considerable departures from the usual text-book description. Thus, the onset was sudden in about 15 per cent. only, and was usually preceded by headache, anorexia, and vague symptoms for a day or two. Though in most cases the temperature rose to 30·5° C. or thereabouts, in others it was as high as 41° C. with a pulse of 70 per minute. In rarer cases the rate might fall as low as 40 and be accompanied by syncope. The muscular pains and neuralgia might be very acute and did not, as is commonly stated, subside with fall of temperature. Some had little or no pain even with high temperature; in others, though the temperature was low, the pain was excruciating. Haematemesis was not infrequent, sometimes so severe as to lead to more than a suspicion of gastric ulcer; epistaxis, intestinal haemorrhage and metrorrhagia were common. Haemoptysis was only seen when tuberculosis co-existed. The liver was in many cases enlarged, jaundice might be marked and last for 15–20 days. Pain over the liver area was sometimes intense and extended to the shoulder, in fact the symptoms were strongly suggestive of cholelithiasis.

Convalescence was often tedious and prolonged; debility was marked and bradycardia persisted, perhaps for weeks.

As regards treatment: in an ordinary case urotropine alone was given; if the pains were severe, aspirin, pyramidon and caffeine; for the general and mental distress, which in some patients was an important feature, bromides with salicylates and strophanthus. Quinine was useless unless malaria was associated with the dengue.

H. Harold Scott.

PONTANO (T.). La pandemia di dengue in Atene. [**The Pandemic of Dengue in Athens.**]—*Policlinico.* Sez. Prat. 1928. Nov. 5 & 12. Vol. 35. Nos. 44 & 45. pp. 2143–2150 ; 2153–2154 ; 2200–2206. With 9 charts in text.

Professor Pontano in this article gives an account of the recent epidemic of dengue and of the special directions in which the usual symptoms were departed from. In the main, as would be expected, he was struck by the same peculiarities as others who have written on this outbreak. Among the symptoms to which he draws particular attention are the early and severe gastro-intestinal phenomena on the first to third days, the dryness of the skin and absence of sweating even when the temperature fell by crisis or rapid lysis. In common with others, he notes the frequency of haemorrhagic cases—cutaneous haemorrhages, epistaxis, haematemesis and intestinal bleeding. Nervous symptoms were prominent in some, giving the picture of a meningitis, encephalitis, myelitis or a polyneuritis. The renal complications in severe cases are also commented upon, and cases occurred (a temperature chart is given in illustration) of definite relapses, repeating the course of the primary attack after an apyrexial interval of eight days.

H. Harold Scott.

LIVIERATO (Spiro) & VAGLIANO (M.). Forme cliniche speciali della dengue e rispettiva terapia. [**Special Clinical Types of Dengue and their Treatment.**]—*Riforma Med.* 1929. Jan. 5. Vol. 45. No. 1. pp. 12 ; 15–16. [Inst. of Clin. Med., National Univ., Athens.]

In the recent epidemic of dengue at Athens amongst the large numbers of ordinary typical cases, certain peculiar types were met with in which the brunt of the disease appeared to fall upon one particular organ. The authors give illustrative cases of three of these types.

1. *Hepatic.* Initial symptoms in these might include epistaxis or haematemesis with subicteric tint of the skin. By the sixth day purpuric haemorrhages were seen, the pulse became progressively slower, jaundice more marked, and the liver enlarged and tender. Three instances of this are detailed ; somnolence was present in all, which deepened to coma in two who died ; the third began to improve on the twelfth day, but convalescence was slow. 2. *Cardiac.* Two cases of this are mentioned. In both the evolution of the disease appeared to be normal till the sixth day in the first, the twelfth in the second. In the first, at this time signs of myocardial mischief appeared—soft sounds, increasing frequency of pulse and cyanosis, and death took place in a few hours. In the second death occurred suddenly with syncope. 3. *Nervous*, with signs of meningitis or meningo-encephalitis, intense headache, rigidity, positive Kernig and Brudzinski signs, delirium, excitation, mental confusion and psychical disturbances. These symptoms made their appearance on the fifth day of what up to that time had seemed to be ordinary typical cases Two are described ; in the second of which the psychic symptoms were very marked. The patient suddenly developed a violent fit of anger, broke everything breakable within reach and threatened to kill everyone in the house ; he then became delirious and declaimed for hours at a time " whole pages of Thucydides and other classic authors " (he was a gymnasium professor). These attacks began to subside on the fourteenth day, convalescence set in by the nineteenth and was uninterrupted.

As regards treatment there is but little to say. It is almost entirely symptomatic, salicylates, aspirin, pyramidon, for the pains, hydro-

therapy for the fever. Urotropine in large doses proved serviceable. Salvarsan injections were valueless in the authors' hands.

H. Harold Scott.

Portocalis (A.) & Flora (G.). Syndrome vagotonique au cours de la dengue. [**Vagotonic Syndrome in Dengue.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. Nov. 29. Year 44. 3rd Ser. Vol. 52. No. 32. pp. 1594–1604.

During the epidemic of dengue in Athens in August and September of last year, the authors noted a great many cases in which the clinical picture differed markedly from that seen in the ordinary acute infectious diseases. The chief differential symptom was a slow pulse (40–70 per minute) when the temperature was 40° C.; such a condition is not common in acute fevers. Other symptoms which went to complete the picture were low blood pressure, profuse sweats, multiple small haemorrhages and asthmatic seizures, the whole clinical picture, in the authors' opinion, being summed up in the term "hypervagotony" and being evidence of a condition of acute suprarenal insufficiency.

Numerous cases are cited and in a summary the various symptoms mentioned above are analysed.

D. H.

Blanc (Georges) & Caminopetros (J.). Expériences faites en Grèce sur le mode de transmission de la "dengue." [**Experiments in Greece on the Mode of Transmission of Dengue.**]—*C. R. Acad. Sci.* 1928. Dec. 3. Vol. 187. No. 23. pp. 1081–1083. [1 ref.]

The authors point out that in Greece confusion exists between sandfly fever and true dengue, and some writers have suggested that dengue can be carried by the sand fly.

They fed Stegomyia on cases of dengue and also collected mosquitoes of the same species in rooms where there were cases of dengue. They then conveyed these mosquitoes to an island off the coast of Crete where dengue was unknown; the two lots of mosquitoes were ground up in saline and injected into seven volunteers; all seven contracted the disease. In another experiment they used laboratory-bred mosquitoes and fed these on cases of dengue on the first and second day of the disease; they then conveyed these to a district where dengue did not exist and fed them on volunteers, 6, 9, 12, 20 and 28 days after the infecting feed; all the volunteers contracted the disease except the man who had been bitten on the sixth day after the infecting feed.

Again some mosquitoes (Stegomyia) were collected in a house where dengue cases were present and fed on three volunteers: one of these volunteers contracted dengue; on the other hand Culex mosquitoes collected in the same rooms did not give rise to infection.

D. H.

Georgopoulos (M.). Die Prüfung des Zustandes der peripheren Gefässe als Methode zur frühzeitigen und sicheren Diagnose des Denguefiebers. [**Test of the State of the Peripheral Vessels in the Early Diagnosis of Dengue.**]—*Muench. Med. Woch.* 1928. Oct. 19. Vol. 75. No. 42. pp. 1793–1794. ["Evangelismos" Hosp., Athens.]

The author noted in the recent pandemic of dengue in Athens that one of the most common symptoms was the appearance of haemorrhages,

from the lung, the nose, the gastro-intestinal tract, from the kidneys and from the bladder. He suggests as an explanation that the unknown virus of the disease causes damage to the walls of the blood vessels. With the view to obtaining proof of the correctness of this suggestion, he carried out a systematic investigation of the condition of the peripheral blood vessels in cases of dengue.

The investigation was carried out by means of the Rumpel-Leede test, in which a bandage is applied tightly to a limb and, on removal, if the result is positive, petechial haemorrhages are seen. This test was positive in practically all the cases of dengue tested by the author and usually appeared by the first day of the disease.

The other test employed was that of Marwitz and Denecke which is carried out as follows : Blood is taken from a vein. The circulation in the artery and vein are then stopped by means of a tight bandage and the arm is held upright for 12 minutes ; at the end of that time a second sample of blood is taken from the vein and the two samples are left overnight, in the ice chest. Next day the expressed sera are examined and, in a positive test, i.e., people with damaged blood vessels, it will be found that there is a thickening of the serum due to loss of water through the walls and a corresponding increase of the albumen content. On the first day of the disease a few only of the cases showed a thickening of the sera, but by the third day nearly all the dengue cases showed this condition, i.e., a positive Marwitz-Denecke test.

The author suggests that as Rumpel's phenomenon appears on the first day of the disease, a positive reaction on that day might be utilized as an aid to diagnosis, whereas a negative result up to the 3rd day would exclude a diagnosis of dengue.

At the same time, it is pointed out that a positive Rumpel reaction may be got in cases of scarlet fever, typhus and malignant endocarditis ; also there are other conditions in which a positive Denecke reaction can be obtained and therefore it is not of so much value on that account and one must rely also on the clinical features to distinguish dengue from scarlet fever, typhus, etc.

D. H.

VERA (Solone). La dengue nei bambini. [**Dengue in Children.**]—*Policlinico.* Sez. Prat. 1929. Feb. 18. Vol. 36. No. 7. pp. 227–229.

Contrary to a fairly common belief that children are not attacked by dengue, the author met with cases in infants at the breast. His remarks are based upon 27 cases varying between three months and fifteen years of age. The symptoms may be the same as those in adults, but in many instances there are considerable differences. The disease may set in with a convulsion, the fever often persists for six says, and, though there is restlessness with insomnia, the acute pains characteristic of adult cases appear to be absent ; vomiting is frequent and epistaxis not rare. Two of the patients relapsed after an apyrexial interval, in one of 8 days. Examination of the blood gave varying results : in some there was leucopenia, in others a normal count, and in others again a leucocytosis. Infection seemed to confer a certain degree of immunity, since it was rare to find an individual who had suffered in the 1927 outbreak being attacked again in that of the following year.

H. Harold Scott.

Syphantos (Sp.). Aperçu clinique sur une épidémie de fièvre dengue. [**Clinical Description of an Epidemic of Dengue.**]—*Presse Méd.* 1928. Dec. 29. Vol. 36. No. 104. pp. 1668–1669.

This paper gives a clinical description of cases of dengue under the care of the author. There is nothing new or out of the way in the symptoms recorded, but the author notes that the conjunction of intense headache with bright red injection of the conjunctiva and congestion of the anterior pillar of the fauces may be looked upon as diagnostic in the very early stages of the disease.

D. H.

Tournier (E.) & Guénolé (A.). Epidémie de dengue hivernale en Chine du Nord. [**Winter Dengue in North China.**]—*Bull. Soc. Path. Exot.* 1928. Oct. 10. Vol. 21. No. 8. pp. 617–619. With 1 chart.

The authors describe a small epidemic of dengue which occurred among the native soldiers of the garrison of Shanhaikwan in North China, 40° N. Only the soldiers in one barrack room suffered, those in neighbouring barrack rooms entirely escaping. There were 14 men in this room and 12 of them were taken ill. The symptoms were typical of severe dengue, with high fever and profuse rash, and all the cases had relapses or recrudescences of fever, and severe pains in the back and limbs with some oedema. An interesting point was that two of the men in the course of convalescence developed a pseudo-tabetic condition with complete loss of knee-jerk, but no Argyll-Robertson phenomenon.

The authors are convinced that no biting insect of the nature of mosquito or sand fly could be concerned in the conveyance of the disease as the time was mid-winter and the temperature was —20° C. and that, therefore, the infection must have been direct from case to case, and since the cases were isolated early they must be infectious in the incubation period as in other eruptive fevers.

D. H.

Morin (Henry G. S.) & Pirot (R.). Sur l'épidémiologie de la dengue d'Extrême-Orient. [**Epidemiology of Dengue in the Far East.**]—*Arch. Insts. Pasteur d'Indochine.* 1926. Apr.–Oct. No. 3. & 4. pp. 41–50. [35 refs.]

The authors refer to the work of the American authorities in Manila. In the American troops, the three chief causes of sickness of late years have been venereal disease, malaria and dengue ; although the admissions to hospital for the first two have been reduced in later years in a remarkable manner, little reduction has been noted in the dengue figures. The admissions to hospital for this disease correspond in a remarkable manner to the distribution in time and place, of *Stegomyia fasciata* and the rôle of this mosquito [*Aëdes aegypti*] as vector was experimentally proved.

The present paper gives an account of an outbreak of dengue which commenced on board a ship in the harbour at Saigon ; the first case occurred in a man who had been on leave to Cap Saint Jacques and who developed the fever on his return, the remainder of the crew went down with dengue, and the infection spread to other ships and to the barracks on shore.

The first patient was suddenly taken ill on 28th April, on 15th May three of the sailors went down with dengue, and from that day onwards fresh cases arose; from the 1st June seven to eight cases a day were admitted.

The interesting point from the authors' point of view is the period that elapsed from the day that the first case occurred until the disease commenced in the remainder of the crew. Also in other ships which were moved from anchorage in the middle of the river into dock, cases commenced to occur in the crews five days after the move.

Thus, if the first case was bitten on the 28th April, then the mosquito would become infective about 9th May (11 days' incubation), and if it then bit the healthy men they would develop fever on 15th May (6 days' incubation), which was the first day of the outbreak on the ship.

D. H.

NICOLAS (Ch.). A propos d'une épidémie de dengue compliquée d'ictère. La dengue serait-elle une fièvre amarylle atténuée? [**Dengue complicated by Jaundice. Relation to Yellow Fever.**]—*Bull. Soc. Path. Exot.* 1928. Nov. 14. Vol. 21. No. 9. pp. 748–752.

In the district of Thio, New Caledonia, the author saw in the course of his duty some 20 cases of dengue, of which eight suffered from severe jaundice as a complication. The eight cases are described in detail; one was fatal, a girl aged eight who had jaundice and "black vomit." The differential diagnosis in this case between yellow fever and dengue was extremely difficult. He adds that many authors have insisted on the close relation between these two diseases and some have described dengue as a mild form of yellow fever.

D. H.

NICOLLE (Charles). Un nouvel exemple d'infections inapparentes. A propos de la découverte, faite par G. Blanc, J. Caminopetros et E. Manoussakis de la dengue inapparente de l'homme et de celle du cobaye. [**Inapparent Infection of Dengue in Man and Guineapig.**]—*Arch. Inst. Pasteur de Tunis.* 1928. Dec. Vol. 17. No. 4. pp. 356–362. [2 refs.]

The author points out that what he means by "infection inapparente," a term introduced in 1919, is an acute attack of a disease with a septicaemia, having an incubation period and a definite course, followed by immunity, but without any clinical symptom, and yet during the period of the infection the blood is infective. [BALFOUR'S expression "cryptic trypanosomiasis" seems to express the same idea.]

BLANC, working in the Pasteur Institute of Athens, found that, in certain cases, susceptible volunteers inoculated with small doses of infective blood gave no reaction. At first he was inclined to think that the dose was too small and that the volunteers had escaped infection, but on inoculating the blood of such men after a lapse of five days into fresh susceptibles, these contracted the disease and the original volunteers proved resistant to massive doses of infective blood, although their own blood was then non-infective, i.e., they had recovered from an attack of inapparent dengue and were immune.

The same phenomenon was demonstrated in guineapigs; these animals showed no reaction when inoculated with infective human

blood, but when the guineapig blood was later inoculated into a human volunteer, he developed a typical attack of dengue.

The same experiment was repeated with a like result. But it was found that if passage from guineapig to guineapig was attempted the blood was not infective for man ; it was only in the first passage that this was so.

D. H.

Ichok (G.). La dengue. [**Dengue.**]—*Rev. d' Hyg. et de Méd. Préventive.* 1928. Dec. Vol. 50. No. 12. pp. 900–908. With 1 text fig. [29 refs.]

As a result of the recent widespread epidemics of dengue in Southern Europe many alarmist and erroneous articles have appeared in the lay press. With a view to counteracting the impressions gathered from these writings the author gives a full and accurate account of our knowledge of the disease up to date.

The first part is historical and deals with previous European epidemics of 1889 and 1899 ; an interesting note is that probably the first clinical description of the disease was made by British Army doctors in India in the year 1824.

A full clinical description of the disease follows and the differential diagnosis from yellow fever, influenza and sand fly fever is discussed. The author points out that all persons seem to be susceptible, from the infant in arms to the old man of 80 years.

D. H.

Le Gac. Notes sur quelques cas de fièvre à Pappataci observés à Abéché et sur les phlébotomes du Ouadaï (Tchad). [**Cases of Pappataci Fever seen at Abéché (Chad).**]—*Ann. de Méd. et de Pharm. Colon.* 1928. Apr.–May–June. Vol. 26. No. 2. pp. 215–227.

Some cases of so-called climatic fever are described which occurred in the district of Abéché. The chief symptoms were fever for three days or so, *slow pulse,* intense retroocular headache, backache, stiffness of the neck and cramp in the limbs, a leucopenia with relative lymphocytosis and slow convalescence. Malaria was excluded by careful blood examination and dengue by reason of absence of any rash ; this also served to exclude seven-days fever. The author concludes that this so-called climatic fever is in truth sand fly fever. Two species of phlebotomus were found in large numbers in the district, *P. minutus* and *P. Dubosqui.*

D. H.

UNCLASSED FEVERS.

i. Plazy & Marçon. Fièvre exanthématique et typhus endémique bénin. [**Eruptive Fever and Endemic Typhus.**]—*Marseille-Médical.* 1928. Dec. 5. Vol. 65. No. 34. pp. 705–711. [3 refs.]

ii. ——, Marcandier & Marcon. Contribution à l'étude de la fièvre exanthématique, ses rapports avec le typhus endémique bénin. [**A Contribution to the Study of Eruptive Fever and its Relation to Benign Endemic Typhus.**]—*Bull. Acad. Méd.* 1928. Dec. 26. Year 92. 3rd Ser. Vol. 100. No. 44. pp. 1450–1456. [6 refs.]

i. The authors were originally of opinion that the " eruptive fever " of Marseilles and of Toulon were very closely related, and considered them to be a form of mild typhus similar to Brill's disease ; but on

consideration of fresh evidence they are inclined to believe that these are two distinct diseases although having many symptoms in common.

In the Marseilles fever the Weil-Felix reaction is almost constantly negative, whereas in the Toulon cases it is positive up to a dilution of 1-1,280 ; also the "tache noire" or primary lesion of the Marseilles fever has not been met with in the Toulon cases.

The Toulon cases with which the authors are primarily concerned, have been called typhoid by some, but the authors describe a case of Toulon fever, positive Weil-Felix, who in convalescence developed an acute attack of enteric fever, with positive blood culture and Widal reaction.

The authors are convinced that the fever met with in Toulon, whatever the Marseilles fever may be, is a mild form of typhus with which it is identical both serologically and clinically.

Lice have not been found on any of the cases, and the authors are investigating fleas and bugs as possible vectors.

Another interesting point is that the majority of the cases have been among the sailors of the Mediterranean fleet, and from the ships which were at one time crowded with refugees in the Near East, many of whom died of typhus.

ii. This paper records the result of an investigation of further cases of " eruptive fever " observed by the authors in Toulon and especially in the maritime population of that seaport. Although the majority of the cases occurred in the summer, cases have now been met with in every month of the year. Five strains of *Proteus X*19 were utilized. The serum was used in dilutions from 1-20 to 1-1,280, and the result was read after the mixture of serum and emulsion had been in the incubator for one hour at 37° C. and 18 hours at room temperature.

All the cases observed by the authors gave a positive Weil-Felix reaction, but this agglutination only appeared after the fever had ceased, and its maximum was reached between the 10th and the 20th day of apyrexia and disappeared at the end of one to two months. Inoculation of blood into guineapigs produced no result.

Two illustrative cases are cited : one of these was severely ill, and forms a link between benign and true typhus; both gave the characteristic curve of agglutination with *Proteus X*19 ; the more severe case giving the higher readings. The readings were negative during the febrile period.

The authors sum up by saying that this disease clinically and serologically resembles benign endemic typhus ; and if they cannot yet say the two diseases are one and the same, yet they are convinced that they are closely allied : and they are also of opinion that the " eruptive fevers " met with elsewhere on the Mediterranean littoral are on clinical grounds very similar.

D. Harvey.

i. Olmer (D.). Nouvelles observations et recherches sur la " fièvre exanthématique." [**New Observations on Eruptive Fever.**]—*Bull. Acad. Méd.* 1928. Oct. 16. Year 92. 3rd Ser. Vol. 100. No. 34. pp. 996–999. [1 ref.]

ii. —— & Olmer (J.). Nouvelles observations et recherches sur la fièvre exanthématique.—*Marseille-Médical.* 1928. Dec. 5. Vol. 65. No. 34. pp. 701–703.

i. This paper deals with the so-called " eruptive fever " of Marseilles. The author states that cases are increasing in number but the mortality

is small, less than 3 per cent., and fatal cases occur only in debilitated persons or in those who are suffering from concurrent disease. He definitely excludes dengue as a possible diagnosis and gives chapter and verse for his opinion. He is also of opinion that the disease is non-contagious and that it is conveyed by insect bite (primary ulcer). As lice can, in his opinion, be definitely excluded, he suggests that the disease vector may be the dog tick (*Ixodes ricinus*).

In favour of this view he cites the following points :—

1. The disease appears only in the summer.
2. The frequency of the disease in rural areas.
3. The presence in immediate contact with the patients of sick dogs, which are heavily parasitized by ticks.

So far experimental confirmation of this suggestion has not been forthcoming, as although ticks have been caused to bite monkeys and have also been injected into monkeys intraperitoneally no fever has resulted, whereas the blood of fever cases injected into monkeys has given rise to fever, although guineapigs are apparently unaffected.

Although some of the cases give a positive Weil-Felix reaction, this reaction is inconstant and quite unlike the results obtained in true typhus fever.

ii. This paper gives some details of experimental work carried out on the Marseilles " eruptive fever " and its epidemiology. The authors repeated the attempts already made by themselves and others to infect guineapigs by injection of blood from patients and again failed to obtain any reaction, but in monkeys, the injection of blood has given rise to a febrile illness which can be passed on experimentally from monkey to monkey.

With regard to the etiology, the authors arrived at the conclusion that the reservoir of the virus might be some domesticated animal, and they suggest the dog and its parasites, notably the tick, *Ixodes ricinus*. However, so far, they have quite failed to infect monkeys either by the bite of the tick or by injection of a suspension of the tick ground up in normal saline.

They cite several cases of patients who have suffered from the fever, and stated that they had been bitten by ticks previously and in whom the " tache noire " developed at the site of the tick bite.

Evidence has also been forthcoming from the veterinary surgeons who state that they have seen many dogs so covered with ticks that they die of fever and anaemia.

It is also suggested that the disease may be conveyed by the dog flea, or possibly that the field vole and its parasites are implicated.

D. H.

Boinet, Piéri (Jean) & Dunan. Recherches nouvelles sur la fièvre exanthématique du littoral méditerranéen. [**New Researches on Eruptive Fever.**]—*Presse Méd.* 1928. Oct. 31. Vol. 36. No. 87. pp. 1377–1379. With 4 text figs.

——, —— & ——. Recherches nouvelles sur la fièvre exanthématique du littoral.—*Marseille-Médical.* 1928. Dec. 5. Vol. 65. No. 34. pp. 703–705.

The authors are convinced that the " Marseilles fever " is neither true nor attenuated typhus ; neither its clinical course nor laboratory findings are in any way similar ; and its mode of transmission is also

different. This fever arises in the summer and is not contagious; cases can be and have been treated in the general wards with cases of other diseases and no fresh cases arise. The disease is not new and has been known to occur sporadically for the last 30 years. The remarkable symptom which distinguishes it from other diseases, including typhus, is the primary sore, and this is probably the site of inoculation. The eruption is nodulo-papular and can be felt by the finger as raised points under the skin.

Histological examination of the "tache" and the papules for the lesions of typhus and for the presence of Rickettsia was made, but nothing resembling these bodies or lesions could be found.

An early lymphocytosis was noted followed by a polynuclear leucocytosis.

The Weil-Felix reaction, although tested throughout the fever and on into convalescence with various strains (including "Kingsbury") of Proteus, was invariably negative. Inoculation of infective blood into guineapigs was negative.

The authors consider that lice and fleas can be excluded as possible vectors, but that it is highly probable that the disease is carried by ticks which are very numerous in the districts where the fever occurs.

D. H.

Burnet (Et.), Durand (P.) & Olmer (D.). La fièvre exanthématique de Marseille est absolument distincte du typhus exanthématique. [**Eruptive Fever Distinct from Typhus.**]—*C. R. Acad. Sci.* 1928. Dec. 10. Vol. 187. No. 24. pp. 1170–1171. [1 ref.]

Burnet, Durand and Olmer set to themselves the query: Is the "eruptive fever" of Marseilles an attenuated form of true typhus similar to Brill's disease?

They took three monkeys which had recently recovered from an attack of the fever, experimentally produced, and showed them to be immune to the fever by tests with injections of blood from cases and infective material from other monkeys. They then inoculated the three monkeys with a known virulent typhus virus (brain of a guineapig). All three reacted to the virus in a typical manner after incubation periods of 7, 9 and 6 days respectively. They then took a monkey which had been immunized against typhus virus by means of repeated injection of the contents of infective lice and showed it to be immune to typhus virus: this monkey was injected with the blood of a case of Marseilles "eruptive fever" and gave the typical positive reaction.

As a result of these crossed-immunity experiments the authors conclud that the fever of Marseilles is in no way related to typhus.

D. H.

Burnet (Et.), Durand (P.) & Olmer (D.). Essais de transmission de la fièvre exanthématique de Marseille par les poux. [**Attempt to transmit Eruptive Fever by Lice.**]—*C. R. Acad. Sci.* 1928. Dec. 3. Vo'. 187. No. 23. pp. 1084–1085.

Although it has been frequently stated that lice have not been found on patients suffering from the "eruptive fever" of Marseilles, yet the authors considered that it would be interesting to carry out some transmission experiments with these parasites. Two 'ots of lice were collected

and fed twice a day on monkeys suffering from "eruptive fever" experimentally produced. The first experiment was carried out by grinding up a number of these lice and injecting the emulsion into clean monkeys; but none of these monkeys developed any signs of illness.

A second lot of lice were fed daily on monkeys suffering from fever and 5 to 17 days later were allowed to feed on healthy monkeys, and also were crushed up in saline and the emulsion injected into human volunteers, all with negative results.

Such results are against the theory that this disease is allied to typhus or that it can be conveyed by lice.

D. H.

Ott. Note au sujet de la menace de typhus exanthématique recemment constatée dans le caza de Rakka, entre l'Euphrate et la frontière syroturque. [**Typhus at Rakka near the Syrian Turkish Border.**]—*Marseille-Médical.* 1928. Dec. 5. Vol. 65. No. 34. pp. 712–717.

This paper deals with a small outbreak of endemic typhus among French colonial troops in the district of Rakka near the Syrian Turkish border. Two soldiers and one hospital orderly were the patients; one recovered and two died. The point of chief interest was to discover the cause of the outbreak, since the two soldiers had been under treatment in hospital for six weeks for other diseases, before the fever commenced on December 11th, and therefore the infection must have taken place in the hospital.

No cases of typhus had been notified in the neighbourhood and none among the troops, but a careful scrutiny of the hospital records revealed that a body of mounted auxiliary Bedouin troops had recently returned from an expedition to the Turkish border, and several of them had been admitted to hospital with severe malignant tertian malaria. One of these men died in hospital on 30th November, and a study of his temperature chart and clinical records showed that he had probably died of typhus, unrecognized at the time, owing to the malarial complication; another man who was on leave died at the same time of fever. The first case of typhus in the hospital commenced on 11th December.

Active measures were taken to isolate and disinfect contacts and a rigid quarantine of the frontier and of the towns was established and no more cases appeared.

D. H.

Medical & Scientific Archives of the Adelaide Hospital. 1927. No. 7. pp. 9–10.—**Case of Hone's Endemic Typhus-like Disease. Death during Convalescence.**

A male, aged 53, admitted with a history of eight days' illness. His face was flushed, florid, dull and expressionless, and the conjunctiva were suffused. Scattered over the chest, abdomen, back and legs was a rash which became less marked towards the extremities and was absent from the hands and feet. The rash consisted of macules and papules and resembled a "dirty measles rash" and did not disappear on pressure. The Widal reaction was negative but the Weil-Felix reaction showed complete agglutination in 1-80 and partial in 1-160; the case was accordingly diagnosed endemic typhus. The temperature fell by lysis and the rash faded, but three days later pneumonia developed and the patient died.

The kidneys were enlarged and deeply congested and the spleen was enlarged, dark red and soft, as also was the liver. Some agglomerations of polymorphnuclear cells were noted in the kidney and around the capillaries of the liver, but no Rickettsia bodies were seen.

D. H.

GHOSE (G.). **Typhus-like Fever. (Colonel Megaw's Tick-Typhus ?).**—*Indian Med. Gaz.* 1928. Nov. Vol. 63. No. 11. pp. 634–636. With 4 figs. & 2 charts.

Two cases are described in detail. The interesting point is that in both there was a clear history of insect bite some days before onset of the fever, and this bite left a definite small ulcer similar to the "tache noire" of Marseilles fever, and also both the patients kept dogs which were tick infested.

The rash is described as maculo-papular, and could be felt by the finger as small nodules under the skin. This rash was present all over the body, also on the face and palms of the hands. The eyes were much congested and red.

The Widal reaction for T., A. and B. was completely negative, but unfortunately no report is given of the result of a Weil-Felix reaction.

D. H.

PAI (M. N.). **Two Cases of (?) Tick Fever from Poona.**—*Indian Med. Gaz.* 1928. Dec. Vol. 63. No. 12. pp. 704–705. With 1 chart.

The author describes two cases of typhus-like fever in soldiers in Poona. The points of interest are the profuse and persistent petechial rash which covered the entire body and face and did not fade for at least four weeks, and the severe joint pains which were complained of in both cases.

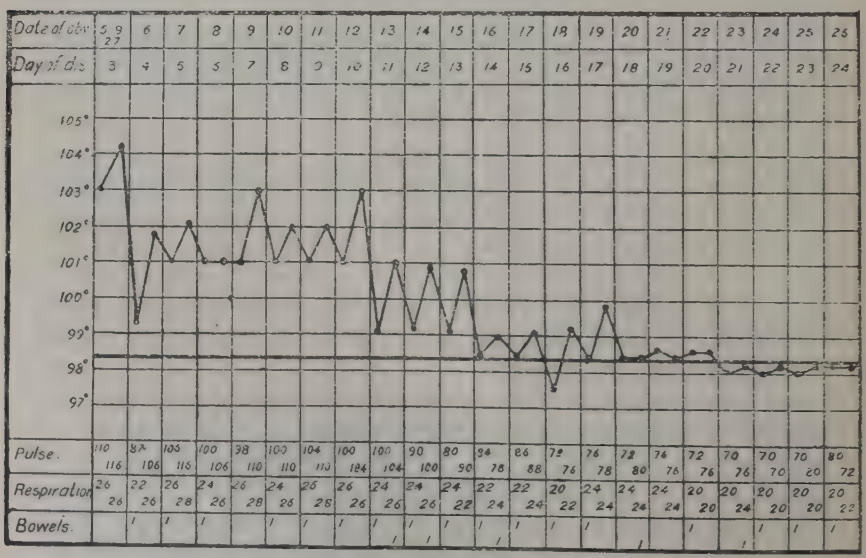


Chart illustrating typhus-like fever case in soldier in Poona.
[Reproduced from the *Indian Medical Gazette.*]

The Widal reaction was negative and blood culture was sterile, but there is no record of the Weil-Felix reaction, and no history of tick bite nor of primary ulcer.

D. H.

YAGI (Tadaaki). [Klinische und experimentelle Untersuchungen ueber Fünftagefieber. (I Mitteilung.)] [**Clinical and Experimental Investigations of Five Day Fever.**]—*Okayama-Igakkai Zasshi (Zent. d. Okayama Med. Gesellsch.).* 1928. Aug. Vol. 40. No. 8. pp. 1693–1723. With 5 graphs & 1 plate. [228 refs.] [In Japanese. German summary p. 1724.] [Central Hosp., Kurashiki.]

This is a description of a case of 5-day fever (trench fever) in a patient aged 72.

[The English Commission on trench fever working with aged volunteers found great difficulty in infecting them by means of lice until it was discovered that these old men were not inconvenienced by the lice and did not scratch.]

The principal symptoms were subjective, and specially notable were the severe shin pains complained of. The fever occurred in paroxysms every fifth day and was invariably accompanied by a polynuclear leucocytosis which disappeared in the apyrexial periods. No parasitic cause of any kind could be found either in the blood or urine, both of which were frequently examined. The treatment was symptomatic.

D. H.

OROYA FEVER AND VERRUGA PERUANA.

NOGUCHI (H.). **Etiology of Oroya Fever. XIII. Chemotherapy in Experimental** *Bartonella bacilliformis* **Infection.**—*Jl. Experim. Med.* 1928. Nov. 1. Vol. 48. No. 5. pp. 619–625. With 2 plates. [8 refs.] [Rockefeller Inst. for Med. Research, New York.]

During his researches into the etiology of Oroya fever, the late Professor Hideyo Noguchi took the opportunity of testing the therapeutic qualities of a series of drugs on his experimentally-infected monkeys.

The following amongst others were tried out: salvarsan, neo-salvarsan, bismuth-lactate, esters of chalmoogra oil, sodium gynocardate, neutro-flavine and urotropine.

Tested *in vitro* on cultures of *Bartonella bacilliformis*, neutro-flavine and formaline were found to be most efficacious and acted in very low dilutions of the order of 1 in ten millions.

When tested on infected monkeys it was found that if the drugs were utilized when the verruga growth was fully developed, and had been present for several days, the growth rapidly retrogressed and disappeared; whereas if the drugs were administered when the growth was in the early stages they had no effect whatever on its development.

The drugs were administered intravenously.

D. Harvey.

DA CUNHA (Aristides Marques) & MUNIZ (Julio). [In Portuguese & German.] Pesquisas sobre a Verruga peruana. Untersuchungen ueber die "Verruga Peruviana." [**Investigations into Verruga Peruana.**]—*Mem. Inst. Oswaldo Cruz.* 1928. Vol. 21. No. 1. In Portuguese pp. 161–166. With 12 figs. on 5 plates (1 coloured). In German pp. 167–172. With 12 figs. on 5 plates (1 coloured).

The authors working with a culture from a case of verruga, which they had received from Dr. ARAGAO, inoculated a monkey (Pseudocebus)

intradermally over one eyebrow and by scarification over the other, and subcutaneously in the right thigh. The chief object of the research was to establish the relation between the cell-inclusions described by MEYER and ROCHA LIMA with *Bartonella bacilliformis*. In ten days time two bluish-red nodules appeared over the right eyebrow at the site of injection, and on the 16th day, blood was drawn off from a vein and was examined by culture in Noguchi's medium, and also by staining, but no organisms could be seen. The temperature of the animal remained normal throughout the experiment.

On the 22nd day the monkey was killed and a careful post-mortem examination made. The heart-blood was cultured and pieces of the various organs removed for section and smear preparations were also made and stained by Giemsa's stain. The nodules and glands which drained the area were removed and embedded in paraffin for section.

In the smear preparations very numerous red cells and polynuclear cells were seen and also many large endothelial cells, and in the plasma of these were seen very numerous pale, pink-staining inclusions, the smallest of them being about 1 to 1·5 μ. in diameter. In some of the endothelial cells there were large masses of this pink-stained granular substance occupying practically the whole of the plasma of the cell, and separated off from the periphery of the parent mass small bipolar stained bacillary bodies could be seen. In other cells the whole mass on careful examination could be seen to be divided up into minute bacillary forms; some of these were dumb-bell shaped; the same appearances were noted in the endothelial cells in sections cut from the nodules. So far as could be made out, there were no inclusions in the red cells.

The authors are of opinion that these inclusions are identical with those described by MACKENZIE and WEISS, as seen by them in material from a monkey which had been inoculated directly from a human case of Oroya fever, and also the masses observed in the cells are in agreement with the description by STRONG and his co-workers of similar bodies in cases of Oroya fever and recognized by them as multiplication forms of Bartonella.

The relationship of these bodies to the Chlamydozoa is also discussed.

In view of the successful treatment of splenectomized rats, in whose blood *Bartonella muris* had appeared, by arsenicals, the authors applied this method to two experimentally-infected monkeys, but the drugs appeared to have no curative effect on the verruga nodules nor have these drugs been found of any avail in the treatment of human cases.

D. H.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Deschiens (R.) & Melnotte (P.). A propos de quelques déterminations extra-intestinales de l'amibiase. [**Diagnosis of Extra-Intestinal Amoebiasis.**]—*Presse Méd.* 1928. Dec. 5. Vol. 36. No. 97. pp. 1545–1546. [2 refs.] [Pasteur Inst., Paris.]

The authors declare that it is not in dispute that intestinal amoebiasis may have, by direct extension or by metastasis, visceral sequelae in the form of abscess of liver ; abscess of brain ; abscess of spleen ; and in the lung a primary abscess or one secondary to abscess of liver. There are, however, some, who, seized with the hypothesis of " a general amoebic disease " have recorded cases of " amoebic " bronchitis ; cholecystitis ; nephritis ; cystitis ; urethritis ;—all primary or secondary, inflammatory or suppurative ;—and even of " amibhémie." In none of these cases has there yet been presented any indubitable parasitological proof in support of these diagnoses. In fact they have been made on the insufficient grounds of finding supposed " amoebae " in the fresh material from the lesions and, or, on the curative effects on the patients of emetine injections.

The authors follow Brumpt in insisting that proof parasitological lies solely in the demonstration in wet fixed and selectively stained specimens of the morphological characters of the *Entamoeba dysenteriae* (Councilmann and Lafleur 1893), and especially of its nuclear structure ; or even by the production of amoebic dysentery in the kitten by inoculation with the suspected material.

The entamoebic infestation index in Fez (Morocco) was found in 1922, by Dekester and Jausion, to be 23 per cent. ; Deschiens in 1925, examining 959 subjects found it to be 21·7 per cent. Fez therefore may be taken to be a centre of amoebic infection of the first order ; and in this centre Melnotte during five years (1923–1927) made a systematic search for visceral lesions of amoebiasis by careful examination of fresh material, immediate and after keeping at 37° C.

Pulmonary. 200 patients—Bronchopneumonia ; bronchitis ; pleurisy ; pulmonary congestion ; with purulent and, or, bloody sputa. (In 150 of the patients amoebae were found in the faeces.) Emetine had no effect on the pulmonary conditions except in 4 cases of pulmonary congestion whose sputa revealed pneumococci—in these 4, rapid amelioration of symptoms followed on emetine injections. The sputa of all 200 never revealed any amoeba free or encysted. Amoebiasis then plays no part in the aetiology of pulmonary affections in Fez.

Urinary. The centrifuged deposits of 300 pathological urines, in Fez, revealed no free or encysted amoebae. Here the authors recall Carvaillo's failure to infect the bladder of kittens (highly susceptible to the infection) with dysentery amoebae [this *Bulletin*, Vol. 24, p. 18].

Emetine cure is not a criterion of amoebiasis. Brelet and Renon have shown that emetine had a beneficial effect on haemorrhagic and congestive conditions : Ramond that it was curative in acute bronchitis ; Flandin that is stopped haemorrhage in haemoptysis ; Romieu that it has a general haemostatic and antiseptic action ; and Guglielmetti has experimentally demonstrated its bactericidal action. Moreover, Iagnov (1928) has shown its success in non-amoebic (post-pneumonic) pulmonary abscess. The authors point out that identification of *E. dysenteriae* in fresh material is difficult even for experts. Organic

inflammatory exudates often contain leucocytes and macrophages containing red blood cells and showing amoeboid movements. If not selectively stained these macrophages may be mistaken for amoebae even by trained workers. It is possible in fresh material by adding to it double iodine solution to distinguish the characters of the entamoeba nucleus—but this technique is not constantly reliable. Wet fixation and differential staining with iron-haemotoxylin is indispensable.

Furthermore, *Entamoeba gingivalis* (Gros 1849), from the mouth, may be found in sputa, and thus be thought to have come from bronchus or lung. Examination of material from the mouth of the patient would exclude such an error. Another possible mistake lies in the presence of intestinal or buccal flagellates. If the flagella are lost the parasite is easily taken for an amoeba—as for example "*Amoeba undulans.*"

[This is an interesting, and valuable, and yet not long, paper, in which some of the now numerous, and increasingly giddy, records of various extra-intestinal lesions and syndromes labelled amoebiasis, are questioned by two authors well equipped for the needed task.]

H. M. Hanschell.

Cort (E. C.). **Amebiasis of the Liver.**—*Jl. Amer. Med. Assoc.* 1928. June 23. Vol. 90. No. 25. pp. 2005–2008. With 3 text figs. [3 refs.] [McCormick Hosp., Chiengmai, Siam.]

Observations on 530 cases of amoebiasis in Siam, 97 of them with hepatic involvement; 14 of these were treated by aspiration; in two cases there was rupture of liver abscess through lung; in one rupture into left pleural cavity, treated by aspiration. Of the 97 cases diagnosed as amoebiasis of liver there was no definite history of previous dysentery in 18. In all 97 cases there were—pain in hepatic region; tenderness and enlargement of liver; intermittent fever. In all, injection of emetine brought about relief of symptoms and reduction of size of liver, in two to four days.

The author concludes that :—

"(1) Emetine, while not a specific for amoebic infections of the intestine, certainly approaches the nature of a specific for amoebiasis of the liver.

"(2) Adequate emetine treatment apparently cures all cases of amoebic hepatitis, and even when large abscesses are present greatly reduces the mass of the liver and converts a poor surgical risk into a good one.

"(3) Aspiration with preliminary and subsequent emetine treatment affords the safest methods of dealing with large abscesses and has the additional advantage of short convalescence."

H. M. H.

Costa-Mandry (O.) & Marin (R. A.). Algunas consideraciones sobre la amibiasis en Puerto Rico. [**Amoebiasis in Porto Rico.**]—*Bol. Asoc. Med. de Puerto Rico.* 1928. Oct. Vol. 21. No. 166. pp. 5–9. [8 refs.] [School of Trop. Med., Univ., Porto Rico.]

Though brief, this paper opens up an interesting question for research. Hegner (1921), Hill & Hill (1927) as a result of the examination of Porto Ricans came to the conclusion that some 500,000 individuals harboured *E. histolytica.** Statistical returns of the Health

* Hegan found *E. histolytica* in 10 of 83 stools of Porto Rican natives. Hill & Hill in 3 of 125 stools of children. How the half-million cases in calculated does not appear.—Ed.

Department show that very few cases of amoebic dysentery are reported and there was only one death in the year from this cause. ASHFORD in 1924, at the International Conference held in Kingston, Jamaica, stated that amoebic dysentery was practically non-existent in Porto Rico. A reference to hospital records revealed only five cases among 93,000 patients.

To obtain further information a questionary was sent to 126 medical men, and replies show that between 2,000 and 3,000 cases of diarrhoea with blood and mucus were seen by them in a year, an average of about 20 cases each ; and altogether there had been only six cases of hepatic abscess.

The authors themselves examined the faeces of 185 cases of acute diarrhoea and found only three of amoebic dysentery. Among the questions asked at the end of the paper are : 1. Is the variety of *E. histolytica* present in Porto Rico less virulent than that found elsewhere? 2. Is there a certain degree of natural immunity to the Entamoeba among Porto Ricans?—both points of considerable interest.

H. Harold Scott.

SUZZI (Dino). L'amebiasi nella citta di Bologna. [**Amoebiasis in Bologna.**]—*Arch. Ital. Sci. Med. Colon.* 1927. Dec. Vol. 8. No. 12. pp. 715–728. With 1 map & 1 chart. [19 refs.] [Inst. of Trop. Path., Univ., Bologna.]

Of 59 cases of amoebic infection the author traced the residences of 44. He gives a spot map of the town and a list of the streets in which cases occurred, from which it is seen that the disease is spread fairly generally and not localized in any particular area, nor confined to the poorer classes.

H. Harold Scott.

i. VENABLES (John F.). **Intestinal Amoebiasis in Britain.** [Correspondence.]—*Brit. Med. Jl.* 1928. Oct. 27. p. 775.
ii. WILLOUGHBY (Hugh). **Intestinal Amoebiasis in Britain.** [Correspondence.]—*Ibid.* Nov. 3. pp. 820–821.

i. Reports the case of a patient with relapsing dysentery, who had never been out of England, in whom after repeated failures to demonstrate amoebae by microscopical examination of stools, sigmoidoscopy revealed the typical small " boil " lesions of amoebic ulceration. From these lesions " encysted amoebae of the histolytica variety " were obtained. The symptoms and lesions disappeared after emetine injections. The author in 8 years had seen 3 other cases in England held to be indigenous intestinal amoebiasis. He insists on the indispensability of sigmoidoscopy in the diagnosis of dysentery.

ii. Supports practice of sigmoidoscopy. Swabbing a lesion is ineffective. Amoebae are more certainly obtained if the lesion be scraped with long-handled spoon. In treatment best results are obtained by emetine bismuth iodide by mouth combined with Yatren, 2½ per cent. solution, lavage per rectum.

H. M. H.

LACAZE (H. P.) & MELNOTTE (P. E. M.). L'amibiase hépatique au Maroc. [**Hepatic Amoebiasis in Morocco.**]—*Arch. Méd. et Pharm. Milit.* 1928. Nov. Vol. 89. No. 4. pp. 351–376. With 1 folding map.

From 1922 to 1927 the authors found, and demonstrated by liver puncture, over 150 cases of liver abscess in Fez. This paper, however, reveals that amoebic hepatitis in Morocco has all the familiar features, and no new ones, of amoebic hepatitis in other countries. The authors break no new ground. Their paper may be commended as an almost complete, and very interesting treatise, on the subject ; which, however, does not permit of any useful summary.

H. M. H.

PETZETAKIS. De la réalité de la cholécystite amibienne. Présence d'amibes dans le pus d'une cholécystite calculeuse purulente. [**The Reality of Amoebic Cholecystitis.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. July 26. Year 44. 3rd Ser. Vol. 52. No. 26. pp. 1295–1297. [4 refs.] Also in *Arch. Ital. Sci. Med. Colon.* 1928. July. Vol. 9. No. 7. pp. 401–404. [4 refs.]

A woman 65 years old, who denied previous dysentery, had suffered from pain in right hypochondrium and right shoulder, and irregular fever. She presented a tender tumour over gall bladder region. The liver was not tender and appeared to be of normal size. Abdominal section revealed a large inflammed gall bladder, with adhesions around. A large stone and pus were evacuated from the gall bladder. Microscopical examination of the pus revealed numerous motile " amoebae," and cysts. Drainage of the gall bladder and emetine injections were followed by rapid return of temperature to normal, and recovery of health.

The author now claims complete proof of the actuality of amoebic cholecystitis—a condition previously described by him, but then only on the proof of emetine cure.

[It is ungrateful, but necessary, to object that his simple report of finding " des nombreuses amibes mobiles et des kystes " in the fresh pus does not yet " montre indiscutablement la réalité de l'existence de la cholecystite amibienne."]

H. M. H.

LAIGRET (J.). Péricardite au cours d'une dysenterie amibienne. [**Pericarditis in the Course of Amoebic Dysentery.**] —*Bull. Soc. Path. Exot.* 1928. Nov. 14. Vol. 21. No. 9. pp. 753–755.

In our epoch, writes the author, when thanks to emetine treatment, liver abscess once so common and so serious tends to become a rarity, it is indeed curious to see arise an " infinity " of other extra-intestinal manifestations of amoebiasis. He gives a list of these, and adds to them pericarditis. He has found but one other case, recorded by Guido IZAR.

This second case, here reported, suffered from amoebic dysentery in Dakar in April 1928. He was treated by emetine and arsenobenzol, but developed a severe pericarditis from which recovery was slow. The author noted that emetine had no effect on the pericarditis and opines that the amoebiasis only indirectly caused it. [It is therefore not clear why he adds pericarditis to the " infinity."]

H. M. H.

Hobbes (R. Hamer). **Periostitis of Tibia following Amoebic Hepatitis.** [Memoranda.]—*Brit. Med. Jl.* 1928. Dec. 15. p. 1092.

The author gives a brief clinical account of a case which he labels amoebic infection of the liver, because the female patient 7 years previously had been cured of hepatitis in Bombay by emetine injections. There was no history of malaria or dysentery. She left India in 1922. In 1925 she was emaciated, suffering tenderness over right hypochondrium, and with irregular pyrexia and rigors. X-rays revealed upward enlargement of right hepatic lobe. Emetine injections were followed by return of liver to normal size and T° to normal. Eleven days after first injection redness, swelling and pain occurred over left tibia and T° 100° F. Incision later released very thick reddish brown pus, sterile, no organisms seen.

H. M. H.

Dargein & Oudard. Abcès hépatique amibien à évolution masquée par un syndrome pleuro-péritonéal suspect. **Hepatic Abscess masked by Pleural Symptoms.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1928. June 7. Year 44. 3rd Ser. Vol. 52. No. 19. pp. 962–966.

The case is very fully described and commented on. Its symptoms and physical signs pointed to a lung lesion. Eventually a large increase in size of liver occurred. Exploratory puncture revealed pus containing vegetative forms of "*Amoeba dysenteriae.*"

The authors quote Fontan appreciatively—"Il est plus difficile de diagnostiquer un abcès du foie que de l'opérer."

H. M. H.

McEnight (R. B.). **Rupture of Hepatic Abscess into the Abdominal Cavity and Inferior Vena Cava.**—*Jl. Amer. Med. Assoc.* 1928. June 16. Vol. 90. No. 24. pp. 1929–1930. [9 refs.]

The author cites 11 cases, recorded by different authors, of communication of hepatic abcess with the inferior vena cava; and adds a twelfth, his own case, fully described in this paper. No amoebae were demonstrated in this case. In all 12 cases diagnosis was made at autopsy.

H. M. H.

Laidlaw (P. P.), Dobell (Clifford) & Bishop (Ann). **Further Experiments on the Action of Emetine in Cultures of** *Entamoeba histolytica.* —*Parasitology.* 1928. July. Vol. 20. No. 2. pp. 207–220. [10 refs.] [National Inst. for Med. Research, London, N.W.3.]

Full details of this work are given. Results lead the authors to conclude that:—

"(1) When emetine is added to complex culture-media containing solid and liquid portions it becomes unequally distributed between the two constituents.

"(2) The distribution between the solid and liquid varies with: (*a*) the nature of the solid, (*b*) the reaction of the system, and (*c*) the time.

"(3) An erroneous idea of the absolute toxicity of emetine for *E. histolytica* is obtained from a consideration of the results of tests with such media (e.g. the egg-serum medium of Boeck and Drbohlav).

"(4) With a simple (liquid) medium [liquid—sterile horse serum, 1 part; Ringer's fluid, 8 parts, with a small quantity of sterile solid rice-starch] it has been shown that a solution of emetine 1 in 5 million is lethal for all amoebae (*E. histolytica*—4 strains) *in vitro* within 4 days, provided that the medium does not become too acid.

"(5) This great potency of emetine *in vitro* may be altered by a comparatively small variation in the reaction of the culture medium.

" (6) The results confirm the view that the therapeutic efficacy of emetine in human amoebic dysentery is probably due to the direct toxic action of the alkaloid upon the amoeba."

H. M. H.

MARTINDALE (W. H.). **Possible Cumulative Effect of Emetine Bismuth Iodide and Emetine Periodide.** [Correspondence.]—*Brit. Med. Jl.* 1928. Dec. 1. pp. 1010–1011.

Calls attention to possibility of a cumulative effect from either emetine bismuth iodide or emetine periodide. The use of both E.B.I. and E.P.I. in amoebic dysentery carriers has been extensive and it has been enphasized that large quantities of E.B.I. are essential; total doses of 30 to 40 grains, in daily doses of 3 to 4 grains. In schistosomiasis in children the dose should be carefully reduced in proportion to age and precaution against accumulation taken, not only by watching general condition of patient, but also by examining urine with an alkaloidal reagent to see that proper elimination is proceeding.

H. M. H.

PELLE (A.) & LE BARON. Amibiase pulmonaire traitée par le pneumothorax et l'émétine. [**Pulmonary Amoebiasis treated by Pneumothorax and Emetine.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1929. Feb. 18. Year 45. 3rd. Ser. No. 5. pp. 234–237.

The authors' exordium is that pulmonary amoebiasis will be considered less rare when the habit of thinking of it develops. They describe a case of pulmonary abscess in a male 25 years old, who four years before had had malaria. Eventually " characteristic amoebae " were found in the chocolate coloured, bloody, foetid sputa—and later amoebic cysts in the stools. The liver was normal. Recovery followed treatment by emetine injections, novarsenobenzol, and artificial pneumothorax. After two injections of emetine, the patient's sputa failed to infect a kitten with amoebiasis.

[One day this thinking of primary pulmonary amoebiasis may perhaps even lead to the attempt to demonstrate amoebae in the sputa by the method by which alone they can be demonstrated to be amoebae—wet fixation and differential staining.]

H. M. H.

BETHEA (Oscar W.). **Specific Treatment of Amebic Dysentery.**—*Jl. Amer. Med. Assoc.* 1929. Jan 26. Vol. 92. No. 4. pp. 310–311.

The author's experience in treating acute and chronic amoebic dysentery in New Orleans has led him to the adoption of a " standard specific " treatment—varied of course on occasion to suit the patient when necessary. It is as follows :—

First period—five days. One grain (0·065 gram) of emetine hydrochlor. daily, intramuscularly. No other medication and unless contraindicated, the patient is put on " full typhoid diet."

Second period—ten days. Emetine injections continued as above and in addition one of the following : 10 phenyl salicylate coated, 5 grain (0·3 gm.) ipecac. pills each night at bed time ; or two tablets of acetarsone [actual dose not stated] each morning on awakening ; or two or three pills of an organic iodine preparation (iodo-oxybenzenepyridine

sulphonate) [actual dose not stated] three times a day. If the ipecac. pills are given at bed time, the patient is given " soft diet " up to 1 p.m. and from then nothing but water, tea or coffee ; bouillon ; ginger ale. If the acetarsone is given in the mornings, no food is allowed for four hours, except the liquids above mentioned. During this second ten day period the patient is given a daily colon irrigation of 30 grains (2 gm.) of quinine sulphate in one half gallon of warm water. The typhoid diet is continued.

Third period—three months. One day each week a full treatment is given as directed in the second period above.

[The author has not overlooked toxic effects. He has had two cases developing " general toxic neuritis characterized by motor incapacity," in arms and legs. He, curiously enough, attributes this to the ipecac. only—and apparently here forgets the emetine hydrochloride. Also he had seen two " rather violent reactions from acetarsone," taking the " form of a marked gastro-intestinal disturbance," with morbilliform rash. Both patients recovered in 7 days. It is to be noted that he advocates the dangerous practice of giving acetarsone to fasting patients.]

H. M. H.

Lemaire (E.). A propos du traitement de la dysenterie amibienne chronique. [**Treatment of Chronic Amoebic Dysentery.**]—*Rev. Méd. et Hyg. Trop.* 1928. Sept.–Oct. Vol. 20. No. 5. pp. 145–146. [1 ref.]

A sous-officier of colonial infantry had suffered for ten years from frequent relapses of amoebic dysentery. Active dysentery amoebae could be demonstrated in the mucosanguineous stools. He had had several hundred emetine injections, and various arsenobenzol preparations by mouth. He had found most relief from emetine injections combined with stovarsol by mouth. On the occurrence of a relapse the author treated him by giving every other day, by mouth, three tablets each containing 0·25 gram stovarsol ; and on the intervening day, five cubes in coffee of Ravaut's paste (composed of powdered charcoal ; bismuth subnitrate powder ; syrup ; glycerine—of each 100 grammes ; and powdered ipecac. 4 grams). Improvement in the patient's condition was immediate and striking ; he soon could forget he was a " dysenteric." The author does not claim a complete cure. He expects relapses but points out the simplicity and ease of this treatment which does not require hospitalization.

H. M. H.

Saujeon (M.). Troubles uro-génitaux guéris par l'émétine. Origine amibienne vraisemblable. [**Uro-genital Symptoms probably Amoebic cured by Emetine.**]—*Bull. Soc. Path. Exot.* 1928. Dec. 12. Vol. 21. No. 10. pp. 883–884.

A woman 24 years of age suffered from frequency of micturition and vulval discharge. She had had an attack of dysentery. Examination of stool revealed numerous ascaris ova ; but no amoebae. An intact hymen prevented vaginal or uterine examination, but the musosanguineous discharge from vagina revealed rounded immotile " amoebae " containing red blood corpuscles. In some slight pseudopodic movements were noted. Clinical cure followed on emetine injections, and later stovarsol by mouth.

H. M. H.

VIALARD. La méthode de Whipple comme thérapeutique adjuvante dans le traitement de l'hépatite aiguë amibienne. [**Whipple's Method as Adjuvant in Treatment of Amoebic Hepatitis.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1929. Feb. 11. Year 45. 3rd Ser. No. 4. pp. 202–208.

Case I. Four years previously dysentery in Haïphong. He had large tender liver, irregular fever, slight thoracic pain, anaemia. No amoebae or cysts found in stools. Apparent cure after emetine injections and a thick liver soup by mouth; and later treparsol by mouth.

Case II. Many previous attacks of malaria, and relapses of amoebic dysentery. Large tender liver; icterus; anaemia. No amoebae or cysts found in stools. Apparent cure followed emetine injections and a diet of calf's liver. In both cases a rapid mount of the red blood cell count to normal followed on the liver diet.

H. M. H.

LANTIN (Pedro T.). **Yatren 105 in Amoebic Dysentery.**—*Jl. Philippine Islands Med. Assoc.* 1928. Apr. Vol. 8. No. 4. pp. 178–181. [3 refs.] [College of Med., Univ. of the Philippines, & Clinics of the Philippine Gen. Hosp., Manila, P.I.]

Twenty-six cases of amoebic dysentery, acute and chronic, responded very favourably to yatren treatment, as demonstrated by faecal examinations during and after administration of the drug. Marked improvement of clinical symptoms occurred at same time as disappearance of trophozoites and cysts from stools. A large amount of the drug by mouth was required to obtain improvement of long duration.

H. M. H.

MONTEL (M. L. R.). Sur un cas de dysenterie amibienne récidivante traité par le "Yatren." [**Case of Relapsing Amoebic Dysentery treated with Yatren.**]—*Bull. Soc. Path. Exot.* 1928. May 9. Vol. 21. No. 5. pp. 367–368.

The patient, aged 47 years, had suffered off and on for 15 years from amoebic dysentery. Many stool examinations had demonstrated free and encysted *E. histolytica*. He had been treated with emetine in 1913–1914 and since then with arsenicals such as stovarsol and treparsol, and with simaruba, as well as E.B.I.—all repeatedly. He was put to bed and given by mouth daily 3 grammes of yatren for 10 days, repeated after 10 days' rest. Three such courses in all. After the first course the stools became formed. After the third the stools revealed no cysts and no free amoebae. The patient has kept well.

H. M. H.

VALLARINO (Joaquin J.). **Report of Further Observations on the Value of Roentgen Rays in estimating the Extent of Amoebic Infection of the Large Intestine.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Nov. 25. Vol. 22. No. 3. pp. 209–214. With 11 figs. on 6 plates.

The only summary of any real value of this interesting paper would be a reproduction of the clear skiagrams by means of which the author definitely and unmistakably illustrated various lesions of the colon in proved cases of intestinal amoebiasis. He began his observations in 1920, and gave a first report of them in 1923. He emphasizes that the final diagnosis must be made by clinician and protozoologist by examination of faeces, but he has nevertheless demonstrated that patients showing certain radiographical signs in the large intestine must needs

have their stools examined in the laboratory and repeatedly examined for amoebae. Radiography may, he has shown, assist the physician by showing the extent and severity of the amoebic lesions, and their disappearance or otherwise under treatment. The defects in the colon shown radiographically are—slight changes such as may be caused by a thickening of the mucosa, or more definite lesions due to erosions or ulcerations which may even take the aspect of gross filling defects; or there may be a smoothing of the bowel wall giving it the " lead pipe " appearance, or again a stricture-like defect caused by an old ulceration or a scar.

H. M. H.

Rees (Charles W.). **Pathogenesis of Intestinal Amebiasis in Kittens.**—*Arch. Pathology.* 1929. Jan. Vol. 7. No. 1. pp. 1–26. With 10 figs. [29 refs.]

A record of an interesting series of experimental observations ; well illustrated by camera lucida drawings of the lesions ; undertaken to ascertain the methods employed by *Entamoeba histolytica* in its attacks on the colon tissue in kittens. The amoebae were cultured (Boeck and Drbohlav). The kittens were infected by injection of material through wall of ligated colon following laparotomy ; and by rectal injection without closing of anus. 84 kittens were used, and from 58 of these data of value to the problem were obtained. Prepared slides of sections through amoebic lesions were studied from fourteen kittens infected after laparotomy and from eight infected by rectal injection.

Amoebic lesions could not be found in kittens that were proved infected after laparotomy, when killed in less than forty hours after the operation ; but after ninety hours there was found destruction of mucosa and investment of colon by a diphtheric membrane. When the amoebae did not succeed in establishing themselves after laparotomy, the mucosa was normal up to ninety hours.

With aid of binocular microscope, minute lesions could be detected in a freshly fixed colon. (Entire colons were often sectionized in an effort to find all the lesions.) The first ulcers detectable after laparotomy usually occurred near the ileocaecal valve, and the lesions were always most severe in this region after rectal injection. In kittens killed four to thirty four days after injection of trophozoites through the anus, there were often well developed ulcers and also minute lesions, but the submucosa appeared not to be invaded in any case. Infection followed much more frequently when faeces from an infected kitten were injected than when amoebae in culture were used. The earliest observed symptom of intestinal amoebiasis was diarrhoea, which occurred at the close of the prepatent* period (two to five days). Evidences of anatomical alterations in the colon following diarrhoea were found to consist in enlarged glands and pronounced goblet cells.

Ulcers in the colon were studied under the binocular microscope in Locke's solution while the tissue was still living. They appeared as hyperaemic areas. Tissue teased from these lesions was found, under higher magnification, to contain living active amoebae—suggesting active tissue invaders. In one colon invasion by amoebae of a solitary lymph gland was noted (illustrated).

* " The prepatent period extends from the time the infective parasites enter the body of the host until their offspring can be recovered by specified laboratory methods. "

Study of the lesions, in this work, does not support view that initial attack of the amoebae on the mucosa begins within the crypts leading to occlusion of latter and development of abscesses.

In all the material studied from kittens infected in both ways (see above), the amoebae appear to have begun the attack on the mucosa ; that is outside the crypts. Ulcers appeared to develop by necrosis beginning at the surface. The amoebic attack provoked a host reaction by hypersecretion of mucus and by hyperaemia. Other evidence of inflammation was manifest, but the part played by bacteria in this reaction could not be ascertained. There was no evidence that this host reaction injured the amoebae.

In many of the lesions the amoebae were not in immediate contact with the cells but separated by a zone of necrosis. This suggests their ability to inflict injury by means of toxins : but the general occurrence of bacteria in the lesions complicated the problem, because they may cause much of the necrosis that one could otherwise definitely attribute to the amoebae.

H. M. H.

Tanabe (Misao) & Chiba (Eiichi). **A New Culture Medium for** *Entamoeba histolytica.*—*Acta Med. in Keijo.* 1928. Vol. 11. No. 3. pp. 63–66 (221–224). [5 refs.] [Med. Faculty, Keijo Imperial Univ., Chosen, Japan.]

This medium is prepared as follows—in the authors' own words :—

" Agar slants are made with Ringer's solution 1,000 cc., agar 10 grs. and asparagin 1 gr. according to the ordinary method. These slants are covered to the depth of agar with Ringer's solution containing rabbit serum in proportion of 5 per cent. Before inoculation, two or three loop-fuls of rice starch which was sterilized at 160–180° C. (dry heat) for about one hour are added to the fluid portion of the medium."

They state that the asparagin is absolutely necessary, and 0·1 per cent. of it gives the best results, and that in their medium the amoebae grew luxuriantly, persisting for 12–14 days—in this medium bacteria do not grow well and putrefactive odour never occurred. A second day culture of strain No. 1 of *E. histolytica* from a human acute dysentery patient was inoculated per anum into two kittens. Careful examination of the kittens' excreta on successive days revealed no vegetative or encysted amoebae. The two kittens died of pneumonia on 13th and 15th day respectively. The intestines and livers were carefully searched macro- and microscopically, but no amoebae nor any pathological areas were found.

H. M. H.

Le Bourdellès (B.), Liégeois (R.) & Ollivier (M.). Essais de culture de l'amibe dysentérique. [**Cultivation of** *E. histolytica.*]—*C.R. Soc. Biol.* 1928. June 8. Vol. 99. No. 19. pp. 79–81. [School of Military Health Service, Lyons.]

The authors briefly describe and discuss their observations with various media. Excellent results were obtained when a pinch of sterilized rice starch was added to the medium, thus confirming observations of Brumpt, Sautet, Dobell and Laidlaw.

They note the rarity of encysted forms in cultures, in marked contrast to their abundance in the human gut. Since cysts appear when symptoms disappear, they suppose that encystment in human gut is in response to an antigen-antibody reaction.

H. M. H.

Sautet (Jacques). Quelques remarques sur les cultures d'*Entamoeba dysenteriae.* [**Remarks on the Cultivation of** *E. dysenteriae.*]—*Ann. Parasit. Humaine et Comparée.* 1929. Jan. 1. Vol. 7. No. 1. pp. 64–79. [83 refs.] [Parasit. Lab., Faculty of Med., Paris.]

The author briefly reviews and comments on the attempts by various workers to cultivate *Entamoeba dysenteriae,* before 1924. To Barret and Smith (1924) belongs the distinction of being the first to cultivate an amoeba pathogenic for the tortoise. Their work was confirmed and completed by Taliaferro and Fisher. In 1924 Boeck and Drbohlav gave us a sure technique for the cultivation of *Entamoeba dysenteriae.* The author reviews their work and then that of Brumpt (1926); Kofoid and Wagner (1926); John, Yorke and Adams (1926); Craig (1926); Dobell and Laidlaw (1926) and finally later work by Dobell; Deschiens; Vogel; Brug; Wagner; Dobell, Laidlaw and Bishop. [All of these papers have received notice in this *Bulletin.*]

H. M. H.

Bourriau (P.). Une épidémie de dysenterie amibienne à l'Asile Départemental de Lafond (Charente-Inférieure) et assainissement de l'Asile. [**Epidemic of Amoebic Dysentery in a French Asylum.**]—*Mouvement Sanitaire.* 1928. June 30. Year 5. Vol. 4. No. 50. pp. 352–365. With 1 chart in text. [4 refs.]

One hundred and eight cases of dysentery—28 deaths. They occurred in an asylum. Chlorination of water supply brought the epidemic to an end.

[Although the dysentery is labelled amoebic, the author records in this paper no evidence whatever why it should have been so labelled; and an asylum dysentery epidemic has yet to be *proved* amoebic.]

H. M. H.

de Mello (Froilano) & da Cruz (L. J. C.). Résultats du traitement expérimental de divers états d'amibiase intestinale par le *Yatren purissimum.* [**Treatment of Intestinal Amoebiasis by Yatren.**]—*Bull. Soc. Path. Exot.* 1928. Dec. 12. Vol. 21. No. 10. pp. 842–845. [School of Med., Nova Goa.]

A brief resumé of observations previously published in *Arquivos da Escola Medico Cirurgica de Nova Goa.*

They conclude that Yatren purissimum is an effective and safe remedy for acute, subacute, and chronic amoebic dysentery in infants.

H. M. H.

Niño (Flavio L.). Sindrome disentérico por asociación amebianotricomonal. [**Dysenteric Symptoms with Presence of** *Entamoeba histolytica* **and** *Trichomonas hominis.*]—*Semana Méd.* 1928. Nov. 8. Vol. 35. No. 45 (1817). pp. 1280–1282. With 1 text fig.

A case recorded with the object of testifying further to the success of Yatren 105. The patient, a man of 30 years, had suffered with dysenteric symptoms for 5 years, passing 12–13 stools a day with blood and mucus.

After three courses of yatren, he has remained free from symptoms for two years.

H. Harold Scott.

Fanelli (Giorgio). Pseudoappendicite da amoeba. [**Amoebic Pseudo-Appendicitis.**]—*Policlinico.* Sez. Prat. 1929. Jan. 14. Vol. 36. No. 2. p. 52.

A girl of 20 years with colicky pains in the abdomen and acute tenderness over McBurney's point and signs of appendicitis. *Entamoeba histolytica* was found in the stools and the condition was cleared up by the use of emetine without operation. [Why " pseudo "-appendicitis ?].

H. Harold Scott.

Castex (M. R.), Greenway (D.), Urdaniz (M.) & Greenway (D. F.). " Un caso de bronco-amebiasis asociada a *Treponema bronchialis* (Castellani)." (Con presentación de preparados). [**Amoebic Bronchitis with** *Treponema bronchiale* (**Castellani**).]—*Arch. Argentinos Enferm. Aparato Digest. y Nutric.* Buenos Aires. 1929. Vol. 4. No. 3. pp. 367–374. With 5 figs. on 3 plates (1 coloured). [2 refs.]

A girl of 16 years with cough and bloodstained sputum. In this were found vegetative forms of *E. histolytica* and Treponemata. The faeces also contained the former. There was no sign of hepatic or pulmonary abscess.

H. Harold Scott.

Bacillary Dysentery.

McGrath (M. J.). **A Description of the Steps taken in a Mental Hospital to prevent the Spread of Dysentery and Allied Infectious Diseases.**—*Jl. Mental Sci.* 1928. Oct. Vol. 74. No. 307. pp. 720–726.

The author emphasizes that an institution free from dysentery is peculiarly susceptible to infection, particularly by a foreign strain from other institutions. Investigations give support to the view that periodic immunization of institutions is continually taking place where preventive measures are not in force. He regards all batches of transfers from other institutions with the greatest suspicion, even though the institutions have a clean bill of health and each individual in the batch is certified to be free from dysentery and enteric. The batches must be detained in a special receiving ward until each individual's examination for infectivity is completed. In combating " asylum dysentery " the first essential is the provision of isolation wards, so arranged that the patients in such ward come into contact, even when exercising in the open, with patients from no other ward. Their laundry and food must be likewise truly isolated, and their attendants be adequately trained to recognize the importance of this disease and the means of preventing its spread, and especially to note themselves (not wait for the patient to report it) the first beginning of diarrhoea in the patient. The blood and faeces of each patient must be examined directly after admission, and the positive ones be isolated. Probationer nurses on joining must also be so examined. The author's figures for five years showed that out of 467 probationers 83 had to be rejected for dysentery or typhoid—the probationary staff therefore provide a source of infection quite as formidable as the new patients. The foundation of the whole scheme is the bacteriological examination ; and a close association must be maintained between clinician and bacteriologist. The dysentery carrier, experience has shown, must submit to permanent isolation.

H. M. H.

Howden (A. L.). **The Bacteriological Examination of Faeces for the Isolation and Identification of the Dysentery and Typhoid Group of Organisms.**—*Jl. Mental Sci.* 1928. Oct. Vol. 74. No. 307. pp. 727–732.

Faeces sent to the laboratory are plated direct on to three previously dried " Rebipel " agar plates ; the plates are incubated at 37° C. for 18–24 hours. On this medium *Bact. coli* produces large red colonies, while those of dysentery and typhoid groups are small and clear. The subcultures and inoculations into sugars are described, as is also the technique of blood culture, Widal tests, and the method of obtaining blood from the patient. They are all according to well known " standard " methods.

H. M. H.

Sasaki (R.). [**Types of Dysentery Bacilli in Kyoto.**]—*Oriental Jl. Dis. Infants.* 1928. Sept. Vol. 4. No. 2. [In Japanese. English summary p. 4.] [Pediat. Clinic, Imperial Univ., Kyoto.]

One hundred and twenty-eight cases were investigated, of which 72 were pure dysentery, 22 fulminating dysentery and 34 enteritis. Dysentery bacilli were isolated in 30 cases of the first, four cases of the second and two cases of the third type. The most prevalent form of dysentery organism was the Oga type, fermenting dextrin, maltose, dextrose and mannite, and seemingly peculiar to Kyoto. Next in frequency came Y and Flexner types, while Shiga and paradysentery were seldom found.

W. F. Harvey.

Cerruti (Carlo F.). Bacilli metadissenterici (Castellani) e *B. coli anaërogenes* (Lembke). [**Metadysentery Bacilli and** *Bact. coli anaerogenes.*]—*Ann. di Med. Nav. e Colon.* 1928. Sept.–Oct. Year 34. Vol. 2. No. 3–4. pp. 153–172. With 1 chart. [31 refs.] [Hyg. Inst., Univ., Turin.]

The author prefaces his work with remarks on the similarity existing between the organisms known as *Bact. coli anaerogenes* of Lembke, the pseudodysentery race E of Kruse, paradysentery group III of Sonne and the metadysentery bacilli of Castellani. His own work consists mainly of comparison of metadysentery bacilli with Lembke's organism, in respect of morphological and cultural characters, final hydrogen ion concentration in glucose- lactose-, and mannite-peptone water, pathogenicity, cross agglutination and absorption tests. He considers that Lembke's organism is a separate species, because the other organisms : (1) have been isolated from dysentery or dysentery-like cases, while it has been isolated from the dog, healthy individuals and by himself from well water ; (2) ferment sugars more slowly, coagulate milk more slowly and do not produce in culture the same final hydrogen ion concentration ; (3) never produce gas in their fermentation of sugars while it can produce a little after repeated subculture.

The anaerogenes colon group may be regarded as intermediate between colon bacilli and the metadysentery bacilli.

W. F. Harvey.

Hoshi (Naotoshi). **[On Child Dysentery in Manchuria, especially on the Bacillus Types and Blood-Findings.]**—*Jl. Oriental Med.* 1929. Jan. Vol. 10. No. 1. [In Japanese. English summary pp. 1–9. 40 refs.] [Dept. of Pediat., General Hosp., Darien.]

Very various methods have been adopted for the typing of dysentery organisms such as mannite fermentation, toxicity towards rabbits, indol production, carbohydrate fermentation, agglutination, etc. The author has investigated the type of dysentery organism occurring in 920 cases of dysentery-like diseases in children. By the use of the agglutination test five types were obtained and the original Shiga type occurred in only 12 per cent. of the 241 organisms isolated. With the carbohydrate method of typing, Y organisms had the largest percentage frequency (46·3), after which came in serial order, Flexner (23·8), Shiga original type (12·2), Hiss IV (5·5) and Strong types (4·3). Most of the children examined were under 3 years of age. The original Shiga type was found more frequently than the other types in children over 7 years and it is this type also which gives the largest mortality. Blood changes were represented by a neutrophile leucocytosis and decrease or disappearance of eosinophiles.

W. F. Harvey.

Leuchs (J.) & Plochmann (E.). Ueber Ruhrbazillen vom Typus E (Kruse). **[Dysentery Bacilli of Type E (Kruse).]**—*Cent. f. Bakt.* I. Abt. Orig. 1928. Dec. 4. Vol. 109. No. 7-8. pp. 398–406. [12 refs.]

The authors have already published work (see this *Bulletin*, Vol. 25, p. 231) relating to the two forms of colony which they obtained with their strains of type E (Kruse) dysentery organisms. These forms are spherical (g type) and flat (fl. type) respectively. In the present research they find that these two types show marked differences in behaviour to agglutinating sera, in complement fixation, in lethality to mice and in susceptibility to a bacteriophage obtained from coli and paratyphoid B organisms. The g forms were the more virulent and more resistant and g-sera agglutinated both g and fl. types but in different degree, while fl-sera agglutinated only fl. types.

W. F. Harvey.

Large (W. T. H.). **Notes on Sonne Dysentery in Lahore District.**—*Jl. Roy. Army. Med. Corps.* 1929. Jan. Vol. 52. No. 1. pp. 1–6. [8 refs.]

When first isolated it was difficult to detect any difference of type among the colonies. After 10 to 12 subcultures two types A and B could be separated: (1) A, the rarer, resembling the Sonne bacillus in all particulars, with crenated irregularly circular colonies, depositing in broth and agglutinating to full titre with Sonne serum; and (2) B, the commoner, closely resembling a Flexner colony, with smooth-edged, circular colonies, not depositing in broth and not agglutinating with Sonne serum. Both types ferment lactose, the A type usually in broth by the 3rd day, the B type by the 5th day. When kept for some time, the B type shows dissociation into colonies of the A or Sonne group III type and of the differing B type. The B type of colony

is the more common and the A type is easily missed. A type B serum is obviously necessary for identification purposes, as well as the type A or true Sonne serum.

W. F. Harvey.

Lommel (Jeanne). *Bacillus dysenteriae.* **Some Observations on a California Strain.**—*California & Western Med.* 1928. Nov. Vol. 29. No. 5. p. 332. [9 refs.] [Med. School, Univ. of California, San Francisco.]

An organism has been isolated from a child suffering from mild diarrhoea with blood and mucus in the stool, which proves to be a member of the Sonne group. It is indol negative, coagulates milk after 3 days, forms acid but no gas in glucose, levulose, mannite, l-arabinose, galactose, mannose and maltose and fails to ferment, even after 3 weeks' incubation, lactose, saccharose, dulcite, adonite, inosite, inulin, salicin and xylose. The antiserum to this organism agglutinates it to a limit of 1 in 4,000 and a standard strain of the Sonne bacillus to 1 in 2,000, while Sonne serum of titre 1 in 4,000 agglutinates it equally to this titre. The strain is not agglutinated by Shiga, Flexner or polyvalent dysentery sera.

W. F. Harvey.

Braun (H.) & Weil (A. J.). Ueber den Ruhrbazillus Kruse-Sonne. [**The Kruse-Sonne Bacillus.**]—*Cent. f. Bakt.* I. Abt. Orig. 1928. Oct. 26. Vol. 109. No. 1–4. pp. 16–30. With 5 text figs. [47 refs.] [Municipal Hyg. Inst., Univ., Frankfurt a.M.]

The authors point out the identity of the Sonne bacillus with race E of Kruse's pseudodysentery bacilli. They enter in detail into the cultural and serological characters of this bacillus, which they maintain is entitled to rank as a true bacterial species and they propose to call it the Kruse-Sonne dysentery bacillus.

W. F. Harvey.

Robic (J.). Une épidémie de dysenterie bacillaire à Madagascar (1927–1928). [**Epidemic of Bacillary Dysentery in Madagascar.**]—*Bull. Soc. Path. Exot.* 1928. Oct. 10. Vol. 21. No. 8. pp. 709–713. [1 ref.] [Pasteur Inst., Tananarive, Madagascar.]

The author has demonstrated that a severe epidemic of dysentery in 1928 was bacillary in nature. Clinically the cases presented no unusual features. No amoebae could be found in the fresh mucosanguineous stools, repeatedly examined ; the microscopic fields crowded with white corpuscles and red blood cells were characteristic of bacillary dysentery. In fact a Shiga bacillus was isolated and its nature confirmed by agglutination tests and rabbit inoculations. Later a Flexner type was also isolated. The author noted that hitherto the dysentery of Madagascar had been taken as amoebic.

H. M. H.

Kerrin (J. C.) & Gill (J. M.). **Flexner Dysentery in a Two-Day-Old Child.** [Memoranda.]—*Brit. Med. Jl.* 1929. Jan. 5. p. 16.

A 48 hours old male infant passed two or three daily loose green mucosanguineous stools. No fever. From these stools a bacillus culturally

indentical with *Bact. dysenteriae* Flexner was isolated. It was agglutinated to full titre with a polyvalent Flexner agglutinating serum. From a rectal swab from the mother an identical organism was isolated.

H. M. H.

Van den Bergh (V. H.). Bijdrage tot de kennis van de biochemie der Dysenterie-Bacteriën. [**Biochemistry of the Dysentery Organisms.**] —*Nederl. Tijdschr. v. Hyg., Microbiol. en Serol.* 1928. Vol. 2. No. 4. pp. 249–255. [18 refs.] [Pharmaceut. Lab., Utrecht.]

A considerable amount of biochemical work has been done with *Bact. coli* organisms and comparatively little with typhoid and dysentery bacilli. Gaseous products, when formed, are invariably carbon dioxide and hydrogen. In this research it is the mixture of acids from fermentation of carbohydrate by dysentery organisms which has been the special object of investigation. The divergence of its chemical activity, taken with the fact of its non-motility and non-possession of catalase, leads the author to consider that *Bact. dysenteriae* Shiga-Kruse lies outside the group of the typho-coli organisms, although allied to it and that the pseudo-dysentery bacilli (Flexner, Hiss) can be regarded as transition forms. Among the differential characters in the typho-coli-dysentery group which are emphasized in the concluding summary are :—

1. These organisms grow better under aerobic conditions, but *Bact. coli* is a much more facultative organism than the others.

2. *Bact. typhosum* and *Bact. dysenteriae*, Shiga-Kruse, show much less luxuriant growth than the other organisms. This characteristic is also manifest in regard to sulphite fermentation, the fermentation of pyruvic acid, the sulphite fermentation of pyruvic acid and the fermentation of sod. formate.

3. Fermentation by *Bact. coli*, the paratyphoid and typhoid organisms results in the production of formic, acetic, succinic and lactic acids, whereas *Bact. dysenteriae*, Shiga-Kruse produces no lactic acid, but abundant acetic acid.

W. F. Harvey.

Doorenbos (W.). Over de bereiding van Dysenterie-Bacteriophaag voor therapeutisch gebruik. [**Preparation of Dysentery Bacteriophage for Therapeutic Use.**]—*Nederl. Tijdschr. v. Hyg., Microbiol. en Serol.* 1927. Vol. 2. No. 2. pp. 139–148. With 2 text figs. [6 refs.] [Lab., Quarantine Council of Egypt, Port Tewfik.]

1. *Bouillon.* The medium used in preparation is the ordinary bouillon of the laboratory, containing 1 per cent. peptone and 0·5 per cent. salt, with reaction pH 7·8 to 8.

2. *Bacterial suspension.* Two standard loopfuls of each of the several strains used are transferred from an 18-hr. agar culture to flasks containing 200 cc. bouillon, to give a light suspension, which must be completely lysed.

3. *Bacteriophage.* The bacteriophage used is a mixture of 7 strains of extreme virulence ; that is to say, each strain must be capable of completely lysing a suspension containing 250 million organisms per cc. One drop is added to each bouillon suspension of organisms and the flasks kept at 37° C. for 10 to 12 hrs. Shiga bacilli are completely lysed in 4 hrs., Flexner and Hiss in 5 to 6 hrs.

Lysis is complete and permanent, but the lysate, nevertheless, is filtered through a Chamberland candle L3 for the removal of any resistant bacilli. The lysates of all the flasks are mixed before filtration. Ampoules are filled with lysate in quantities of 2 to 3 cc.

For use the contents of one ampoule are mixed with half a glass of ordinary water and drunk off. A second dose is taken 12 hours later, and, if necessary, a third dose after another 12 hours. No contra-indications exist to the administration of bacteriophage in bacillary dysentery and the earlier the better. If ampoules are kept in a cool place, the bacteriophage will preserve its virulence for years. Should the contents of an ampoule become turbid, it must not be used. Convalescence should set in within 24 hours of administration. Bacteriophage can also be used prophylactically, and a dose of 2 cc. every 3 days confers complete immunity for as long as it is continued.

W. F. Harvey.

Matsumoto (Kaoru) & Seki (Takashi). **Immunological Studies of the Constituents of** *Bacillus dysenteriae* **(Shiga).**—*Japan Jl. Experim. Med.* 1928. Nov. 10. Vol. 7. No. 1. pp. 1–7. [5 refs.]

A considerable amount of work has been done to show that bacteria consist of nucleoprotein, which is antigenic both *in vitro* and *in vivo* and species-specific, and of "residue" or "soluble specific substance," said to be a complex carbohydrate, which is not antigenic *in vivo* but is type-specific *in vitro*. Shiga dysentery bacilli also consist of the same two types of substance. The nucleoprotein is found to be toxic and the residue substance non-toxic. Rabbits were immunized with whole bacteria, with nucleoprotein and with residue. Agglutinin formation showed itself highest with whole bacteria, next with nucleoprotein and least with residue. The purer the residue the less the agglutinin that was developed. Tests carried out on mice showed that anti-bacterial serum had the greatest protective power, that antinucleoprotein serum came next and that antiresidue serum was inefficacious.

W. F. Harvey.

Ponomarew (A. W.) [Sur quelques conditions de l'action sur l'organisme des sérums antidiphtérique et antidysentérique.] [**Some Conditions of Action of Antidiphtheritic and Antidysenteric Sera.**]—*Arch. Sci. Biol.* 1928. Vol. 28. No. 4. pp. 463–470. [14 refs.] [In Russian. French summary pp. 501–502.]

The argument, on which is based the contention of the author that before antisera can act in neutralizing toxins affecting the central nervous system, a barrier to their circulation has to be overcome, is provided by the experiment that, after a rapid succession of compressions and decompressions of the brain, antidiphtheritic serum will appear in the cerebrospinal fluid, but will not appear without this preliminary operation. In animals in which this barrier has been broken down, antidiphtheritic serum injected into the ear vein will neutralize toxin that has been injected into the other ear vein 45 to 60 minutes previously, or at least greatly delay death, whereas control animals with barrier intact die in 2, 3, or 4 days. Even animals with declared symptoms could be saved. Similar experiments were successfully carried out with antidysenteric serum.

W. F. Harvey.

TREVAN (J. W.). **A Statistical Note on the Testing of Anti-Dysentery Sera.**—*Jl. Path. & Bact.* 1929. Jan. Vol. 32. No. 1. pp. 127–134. With 4 graphs in text. [2 refs.] [Wellcome Physiol. Research Labs., Beckenham, Kent.]

Greater accuracy in the determination of the L+ dose of serum is obtainable the less the amount of toxoid present in the toxin, the larger the number of lethal doses used and the steeper the toxin mortality curve. A high degree of accuracy has been obtained in the case of diphtheria toxin and serum titration but "the individual L+ doses of antidysentery serum for mice vary over a comparatively wide range." This statistical note is summarized by the author as follows :—

1. Methods of evaluating the error of determination in toxicity determination are described and applied to the estimation of the potency of anti-dysentery serum.

2. The error of estimation of the potency of Shiga anti-dysentery serum by the method recommended by the League of Nations Health Committee is calculated. If 40 animals be injected, half with a standard serum and half with an unknown serum, the potency of the known serum in terms of the standard will be not less than 70 per cent. and not more than 140 per cent. of the true value in 95 per cent. of such tests.

3. The use of multiple test doses of toxin as described by BLAKE and OKELL is shown to diminish the limits of error to 88 per cent. and 112 per cent. of the true value for the same number of animals.

W. F. Harvey.

BLAKE (Adelaide V.) & OKELL (C. C.). **Standardisation of Anti-Dysentery Serum : Effect of Increased Test Dose of Toxin on the Accuracy of Titration.**—*Jl. Path. & Bact.* 1929. Jan. Vol. 32. No. 1. pp. 121–126. With 1 graph in text. [3 refs.] [Wellcome Physiol. Research Labs., Beckenham, Kent.]

The titration of antidysenteric sera has not yet attained the accuracy of methods used for antidiphtheritic and antitetanic sera. This is partly due to wide variation in susceptibility of individual mice and partly to difficulty in obtaining a toxin sufficiently concentrated or in a physical state suitable for intravenous injection. It has been shown, likewise, that the substitution of rabbits for mice does not diminish the variability in results of titration. The varying susceptibility of mice is shown by the results obtained with a Shiga toxin consisting of dried bacillary bodies which, for doses of 0·02, 0·01, 0·005 and 0·0025 mgm., gave percentage mortalities of 100, 80, 45 and 30 per cent. respectively. The experiments of the authors have shown that there is no need to restrict the test dose to the small amount suggested. Five times that dose may be used and with considerable improvement in accuracy. A further objection to the use of bacillary body toxin is that, in saline suspension, it is not capable of diffusing easily throughout the suspending fluid. A toxin has been prepared, which gets over this difficulty, by adding 40 per cent. solid ammon. sulphate to a filtrate of a 14-day Shiga culture and drying the precipitate. The stability of the toxin has so far proved satisfactory. Whereas, with the League of Nations test dose, a 33 per cent. drop in survival rate of mice corresponds with a 34 per cent. drop in antiserum potency, the same survival rate has represented, when 5 times that dose was used, a 19 per cent. drop in serum potency. The toxin prepared by precipitation with ammon.

sulphate was used in dose equal to $2\frac{1}{2}$ times the League dose and in this case a 33 per cent. survival rate represented a drop of 8·5 per cent. in serum potency. These show approximation in accuracy to antidiphtheritic and antitetanic serum titrations.

W. F. Harvey.

Hosoya (S.) & Stéfanopoulo (G. J.). Etude sur la nature et la purification de la toxine dysentérique. [**Nature and Purification of Dysentery Toxin.**]—*C.R. Soc. Biol.* 1928. Vol. 99. No. 38. pp. 1911–1914. [1 ref.]

The method used is the same as that described already in conjunction with Miyata (*C.R. Soc. Biol.*, 1928, Vol. 99, pp. 773, 1297 & 1465) for tetanus, diphtheria and botulinus toxins. The preparation from agar cultures is as follows :—

(1) Heat a thick suspension of the growth from 48-hr. cultures in distilled water (12 Roux bottles in 200 cc.) for 1 hour at 58° C. (2) Leave at laboratory temperature for 24 hours. (3) Add a solution of caustic soda until the mixture attains an alkalinity of N-100. (4) Shake from time to time for some hours. (5) Filter through infusorial earth. (6) Add 2 per cent. zinc chloride to the viscous filtrate, until precipitation is complete. (7) Filter through paper. (8) Wash the precipitate on the filter paper several times with distilled water. (9) Suspend the precipitate in a little water and redissolve it by the addition, drop by drop. of neutral ammon. sulphate. (10) Add ammon. sulphide to get rid of the zinc. (11) Neutralize the liquid by acetic acid and dialyse in running water for 24 hours.

The liquid remaining in the dialyser is the purified toxin and gives the biuret reaction. A rabbit receiving 1 cc. of this purified toxin intravenously shows paralysis, a profuse diarrhoea on the 4th day and dies on the 5th day.

W. F. Harvey.

Hosoya (S.) & Stéfanopoulo (G. J.). Toxine dysentérique purifiée abiurétique. [**Abiuretic Purified Dysentery Toxin.**]—*C.R. Soc. Biol.* 1929. Jan. 11. Vol. 100. No. 1. pp. 8–11. [2 refs.] [Pasteur Inst., & Imperial Inst. for the Study of Infect. Dis., Tokyo.]

The toxin is prepared from 48-hour agar cultures as follows :—

(1) Heat a thick suspension of growth for 1 hr. at 58° C. (2) Leave at laboratory temperature under a layer of toluene for 24 hrs. (3) Filter through infusorial earth and then through an L3 Chamberland candle. (4) Treat the filtrate in the manner already described (see above).

The liquid which remains in the dialyser is called " purified toxin No. 1." and gives neither the reaction of Millon nor the biuret reaction, after it has been concentrated to 1-10th of its original volume. This toxin, injected intravenously, kills the rabbit in a dose of 0·05 cc. One rabbit showed symptoms of diarrhoea, which passed off, to be followed by paralysis of the limbs and death. None of the others showed diarrhoea, but either died rapidly or after paralysis. At their autopsy there was, in all cases, a characteristic dilatation of the bladder, but none, not even that with diarrhoea, showed any intestinal lesions. This toxin, mixed with antidysenteric serum, left for 20 minutes at room temperature and then inoculated intravenously, caused no symptoms.

A further purification of the toxin can be effected by precipitating the " No. 1 toxin " completely with 4 per cent. zinc acetate, filtering through paper, washing the precipitate and dissolving it with dilute ammon.

citrate. To this solution ammon. sulphide is added and it is then filtered. The filtrate is dialysed for 24 hrs. in running water and the liquid remaining in the dialyser is the purified " toxin No. 2."

W. F. Harvey.

Mazzeo (Mario). Neutralizzazione della tossina dissenterica mediante la colesterina. [**Neutralization of Dysentery Toxins by means of Cholesterin.**]—*Riforma Med.* 1928. Nov. 12. Vol. 44. No. 46. pp. 1487–1491. [9 refs.] [Roy. Hyg. Inst., Univ., Naples.]

Two types of experiment were performed. In the first experiment cholesterin, in amounts of 0·5 mgm. daily, was given with the food to rabbits of about 800 gm. weight for 10 days. The rabbits were inoculated with 1 (0·15 cc.), 2, 4, 5, and 8 minimum lethal doses of dysentery toxin and were able to survive 5 lethal doses. In the second experiment the same series of lethal doses was used, but mixed with the cholesterin and kept for 10 hours at 37° C. before being inoculated. The rabbits were now able to recover after inoculation of 25 lethal doses. These results, although they do not suggest a neutralization of toxin similar to that of antitoxin, have their counterpart in the experiments done by others in the neutralization of tetanus and diphtheria toxins and of rabies virus by cholesterin. Animals in which the suprarenals have been removed are very susceptible to autointoxication and other toxaemias. This also points to the probability that cholesterin, which is a product of suprarenal activity, is an important factor in the mechanism of natural protection against toxins.

W. F. Harvey.

Enlows (Ella M. A.) & Brooks (S. C.). **A Comparison of the Agglutinin and Antitoxin Content of Antidysenteric Serums.**—*Jl. Lab. & Clin. Med.* 1928. Nov. Vol. 14. No. 2. pp. 103–112. [49 refs.] [Hyg. Lab., U.S. Public Health Service, Washington.]

Tables are given by the authors showing simultaneous details of agglutination titres and protection of rabbits or mice by control and commercial serums. They point out that the data are inadequate, the statistical analysis unsatisfactory and the probable errors high. On the results, taken as a whole, they conclude : (1) that there is no necessary parallelism between agglutination titre and antitoxic content as usually measured by protective power, nor between this protective power against neurotoxin as compared with enterotoxin; but (2) that a slight positive correlation exists between agglutination titre and antitoxic power so that high agglutinin titre tends to be accompanied by high protective power.

W. F. Harvey.

Suzaki (Keizo). [Relation entre l'age et l'influence de la toxine de la dysenterie sur l'intestin du lapin.] [**Relation between Age and Influence of Dysentery Toxin on the Rabbit's Gut.**]—*Oriental Jl. Dis. Infants.* 1928. Nov. Vol. 4. No. 3. [In Japanese. French summary p. 30.] [Pediat. Inst., Imperial Univ., Kyoto].

The author found that the " dysentery " toxin acted on rabbit's intestine as follows :—

Rabbits 10 days old : exaggerated movements of duodenum, jejunum and ileum ; and feebly accelerated movement of the large intestine.

Rabbits 24–25 *days old* : as above ; but the movement of large intestine was very feeble or none.

Rabbits 50 *days old* : exaggerated movements of duodenum and jejunum. But ileum and colon no acceleration, and sometimes a slowing down.

Rabbits over 2½ *months old* : accelerated movement of duodenum and jejunum, and slowing down of ileum and colon.

H. M. H.

Suzaki (K.). [**The Influence of Dysentery Toxin of the Extirpated Intestine of Rabbits.**]—*Oriental Jl. Dis. Infants.* 1928. Sept. Vol. 4. No. 2. [In Japanese. English summary p. 7.] [Pediat. Clinic, Imperial Univ., Kyoto.]

——. [**The Physiological and Immunological Studies of the Exotoxin of Dysentery Bacilli.**]—*Ibid.* [In Japanese. English summary p. 8.] [Pediat. Clinic, Imperial Univ., Kyoto.]

These papers deal with the action of dysentery toxin on the peristalsis of the intestine. The exotoxin of dysentery bacilli has specific immunological property and is common to all the species, although produced in far the greatest amount by Shiga bacilli.

W. F. Harvey.

Newman (R. E. U.). **Report on a Trial of Oral Immunization against Bacillary Dysentery in the Western Command, India, in 1927.**—*Jl. Roy. Army Med. Corps.* 1929. Jan. Vol. 52. No. 1. pp. 7–10. [1 ref.]

The immunization was carried out with antidysenteric bile vaccine and the vaccine was administered to volunteers. Care was taken to ensure that these volunteers really did swallow their tablets. The admission rate for bacillary dysentery was made the gauge of successful immunization. Among the volunteers this was 17·24 per mille and for the non-immunized controls 40·25 per mille. Cases of protozoal dysentery were excluded. When a similar series of cases at a second station were added to the former the rates worked out at 15·38 and 32·44 respectively (780 immunized ; 863 controls).

W. F. Harvey.

Frankel (Ernst). Versuche zur Frage der peroralen Immunisierung. II. Mitteilung. Perorale Immunisierung bei der Maus gegen Shiga-Ruhr. [**Oral Immunization of the Mouse against Shiga Dysentery.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1928. Vol. 59. No. 5–6. pp. 416–423. [13 refs.] [Cancer Research Inst., Univ., Berlin.]

Mice were used because larger numbers, amounting to over 400, could be employed in the research. The immunization trials bring out the effects of large, moderate and small doses. For the oral immunization a suspension of killed bacilli in normal salt solution was administered with oesophageal sound and syringe after 3 per cent. sodium benzoate. A constantly lethal infecting dose of 1-20th. agar slope culture subcutaneously was used. The largest doses (20–80 loopfuls) not only had no immunizing effect but seemed to render the test animals more susceptible than the untreated controls. With moderate doses of half a loopful increasing to 5 loopfuls on 3 successive days, or on the first, fifth and tenth days, immunization was shown by increased duration of life and survival of single animals. If these same doses were given

fractionally, three times in the day, about half the animals (13 out of 22) could be protected. Small doses were ineffective for immunization. How far these results in mice are applicable to man is reserved for another publication.

W. F. Harvey.

Vaz (Eduardo). Sobre o preparo da vaccina antidysenterica " per os." (Segunda memoria). [**Preparation of Antidysenteric Vaccine.**]—*Sciencia Med.* 1928. Nov. Vol. 6. No. 11. pp. 552–563. [2 refs.] German summary p. 564.

The object of this investigation was to save labour and cost in the manufacture of antidysentery vaccine on a large scale. It was found that neither the cost nor the incubation time could be diminished without impairment of the efficacy of the vaccine. This trial applied to fluid media vaccines. Several interesting points emerged from the experimentation. The greatest efficacy was found: (1) for bouillon cultures as compared with peptone water; (2) for 3 weeks' incubation as compared with 2, 4, 7, 10 and 14 days' incubation; (3) for culture in smaller, rather than in larger quantities of bouillon—quantities such as 50, 200, 1,000 and 2,000 cc.; (4) with good aeration of culture.

Filtrates were capable of immunizing but only if derived from a bouillon with a heavy growth of organisms.

W. F. Harvey.

Mixed and Unclassed Dysentery.

Khouri (J.). Contribution à l'étiologie de la dysenterie en Egypte. [**Aetiology of Dysentery in Egypt.**]—*Bull. Soc. Path. Exot.* 1929. Jan. 9. Vol. 22. No. 1. pp. 8–11.

The author tabulates the results of a long series of observations, 1903–1927, of the frequency of different causes of dysentery and dysenteriform diarrhoea in Egypt. Thus:—

	Per cent.
Entamoeba histolytica (vegetative)	13·8
Entamoeba minuta	2·8
Amoebic cysts	7·3
Balantidium coli	1·2
Lamblia (*Giardia*) *intestinalis*	0·4
Tetramitus mesnili	0·2
Trichomonas intestinalis	0·7
Schistosomum mansoni / *Schistosomum haematobium*	5·5
Ankylostomum duodenale	0·6
Mycoses (Moniliasis)	2·5
Koch's bacillus	0·3
Divers bacteria	65·5
	100·0

	Per cent.
Amoebic dysentery in the years 1903 to 1916	28·0
Amoebic dysentery in the years 1917 to 1921	17·2
Amoebic dysentery in the years 1922 to 1927	9·5

Bacterial dysentery is the most frequent form (65·5 per cent.)—due to Shiga, Flexner, Coli, bacillus and to the enterococcus. [The author

attributes the remarkable drop in amoebic dysentery cases to the increased use of emetine therapy. He does not mention any increased accuracy in diagnosis; nor the growing recognition of true bacillary dysentery.]

H. M. H.

THORLAKSON (P. H. T.). **Ulcerative Colitis.**—*Canadian Med. Assoc. Jl.* 1928. Dec. Vol. 19. No. 6. pp. 656–659. With 3 text figs. [20 refs.]

This paper is a general survey of this disease and it is illustrated with excellent X-ray photos af the typical pipestem colon of ulcerative colitis, and of the ulceration of the colon, in one case malignant. The author's experience lends no support, but rather the contrary, to the view that BARGEN's non-mannite-fermenting diplococcus is the causal agent of the disease. In one of his cases a pure culture of this diplococcus was obtained from rectal scrapings, but contrary to BARGEN's reports the autogenous vaccine made from this organism brought about no improvement in the patient. In contrast, however, is the important finding by the author that by sigmoidoscopy and using a " sharp cutting curette with a very small spoon and a long handle " he is able to obtain a small section of the base of the ulcer and not merely a surface smear. In four of his last five cases F. CADHAM had been able to isolate *Bact. dysenteriae* from these small ulcer sections. Three belonged to Flexner group and the fourth to Shiga. In treatment he has had good results from caecostomy and irrigation, and injections of antidysenteric serum. He concludes that "ulcerative colitis" is due to infection with *Bact. dysenteriae* and should be regarded as a form of bacillary dysentery.

H. M. H.

BRUCHMANN (Carlos A.) & DE NUCCI (Luis Stabile). Enterocolitis disenteriformes graves en la infancia observadas en la ciudad de Santiago del Estero. [**Severe Dysenteriform Enterocolitis in Infants in Santiago del Estero.**]—*Semana Méd.* 1929. Feb. 28. Vol. 36. No. 9 (1833). pp. 514–519.

This is a serious condition, perhaps contagious, occurring in quite young children, usually from one to four years of age. Nearly all have been fed artificially. The stools are loose, mucoid, sanguinolent, and may contain pus, 30 to 50 in the 24 hours, occasionally as many as 80; some are of the choleraic type. The case-mortality is not stated, but two of the six detailed died. The condition is one calling for further study.

H. Harold Scott.

TSUCHIYA (K.) & NAGATA (S.). [**On Dysentery in South Manchuria.**]—*Jl. Oriental Med.* 1928. May. Vol. 8. No. 5. [In Japanese. English summary pp. 71–84. 9 refs.]

(1) Since 1923, dysentery cases and deaths from dysentery have been numerous and increasing.

(2) In the last 3 years most cases have occurred in June, July, August and September.

(3) In South Manchuria Shiga bacillus was isolated mostly from cases in children. Its toxicity was greater than that noted in Japan.

H. M. H.

MAHLER (P.). Obstipatio spastica postdysenterica. [**Post-dysenteric Spastic Constipation.**]—*Med. Klin.* 1928. Sept. 7. Vol. 24. No. 36 (1239). p. 1392. [2nd Med. Clinic, German Univ., Prague.]

The author gives this name to a syndrome whose main features are rather sudden onset of cramp in abdomen, and nausea, in an apparently previously healthy person, whose medical history, however, reveals an attack of bacillary dysentery years previously. There is also obstinate colonic spasm accompanying the cramp.

H. M. H.

CAFFREY (P. J.). **Triple Intestinal Infection in a Case of Dysentery.**—*West African Med. Jl.* Lagos. 1928. Apr. Vol. 1. No. 4, pp. 68–69.

A Hausa, aet. 30 years, suffered from anaemia, tachycardia, diarrhoea and slight fever. Faeces contained blood and mucus and ankylostome ova. These ova disappeared finally after treatment with Ol. chenopodii, Acute dysentery developed and faeces then revealed amoebae and ova of *Schistosoma mansoni*. Both disappeared under emetine treatment and patient was apparently cured.

H. M. H.

SCHILL (Emerich). *Lamblia intestinalis* neben Zeichen von Cholelithiasis. [**Presence of *L. intestinalis* in Case of Cholelithiasis.**]—*Deut. Med. Woch.* 1928. Aug. 10. Vol. 54. No. 32. pp. 1337–1338. [16 refs.] [1st Med. Clinic, " Pázmány Péter " Univ., Budapest.]

A male patient 27 years old presented the clinical signs of cholecystitis and cholelithiasis. Duodenal tube contents revealed among other things vegetative forms of *Lamblia intestinalis*, and in the stools were found cysts of lamblia. The author is of opinion that the lamblia caused the gall bladder disease. Duodenal washings with magnesium sulphate 20 per cent. solution, and intravenous injections of 0·15 to 0·3 gm. neosalvarsan were followed by disappearance of lamblia from duodenal tube contents and by disappearance of clinical symptoms. The author notes some of the recorded findings of lamblia in stool and duodenal contents and the conflicting views of the recorders as to its pathogenic role, more particularly as a cause of gall bladder disease.

H. M. H.

KIPSCHIDSE (N.). Zur Frage der pathologischen Bedeutung des *Balantidium coli*. [**The Pathological Significance of *Bal. coli.***]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. May. Vol. 32. No. 5. pp. 253–255. [Therap. Hosp. Clinic, State Univ., Tiflis, Georgia.]

In the last four years 22 cases of *Balantidium coli* infection have been treated in hospital, of which 3 came to autopsy. The author notes that WALKER (1914) by means of experimental infection of apes established the identity of the balantidium of man and pigs. In the Republic of Georgia balantidiasis of man is not rare ; it is also a frequent infection of pigs. Thus the author examined 210 freshly killed pigs in the Tiflis slaughter houses and found balantidium in 134=63·3 per cent. Brief descriptions are given of 8 typical cases in men. The predominant symptom was diarrhoea for months or even for a year. The stools are loose and contain, with much mucus, pus or even blood. The patients complain of pain in abdomen in the region of the colon. Stools may be as frequent as 15 to 20 a day, in the chronic cases 5–6. The patients are weak, without appetite, and have low fever. In treatment the

author found emetine, in large doses, 0·05–0·06 gm. and 15 to 20 injections, gave the best results. Cases infected also with *Entamoeba histolytica* and *Lamblia intestinalis* were more difficult to cure.

H. M. H.

Seki (Yoichi). [**Hydrogen-Ion Concentration of the Urine of Dysentery.**]—*Oriental Jl. Dis. Infants.* 1928. Sept. Vol. 4. No. 2. [In Japanese. English summary p. 9.] [Pediat. Clinic, Imperial Univ., Kyoto.]

The urine of cases of fulminating dysentery and of pure dysentery had a reaction of pH 5·8 on the first and second days of the disease and was normal again (6·0–7·9) from the third day. Thus there is, in dysentery of children, an evident acidosis on the first and second days.

W. F. Harvey.

Auricchio (Luigi). L'amebiasi nell' etiologia delle sindromi dissenteriche nell' infanzia.—*Pediatria.* 1929. Feb. 15. Vol. 37. No. 4. pp. 169–173. [17 refs.] [Inst. of Clin. Pediat., Univ., Naples.]

Castigliola (Orlando). Intorno ad un caso di ascesso epatica apertosi nel polmone.—*Arch. Ital. Sci. Med. Colon.* 1928. Jan. Vol. 9. No. 1. pp. 7–21. ["Vittorio Emanuele III" Colonial Hosp. Tripoli.]

Corkill (Basil). "Yatren" Treatment of "Simple" Ulcerative Colitis.—*Med. Jl. Australia.* 1928. Nov. 10. 15th Year. Vol. 2. No. 19. pp. 589–591. [5 refs.]

Franchini (Giuseppe). Un nuovo caso di *Buba brasiliana* contemporaneo ad affezione da *Entamoeba histolytica,* da *Anchilostomum duodenalis* e da *Trichostrongylus.—Arch. Ital. Sci. Med. Colon.* 1928. July. Vol. 9. No. 7. pp. 387–393. With 3 text figs. [Inst. of Trop. Path., Univ., Bologna.]

Gelonesi (G.). Un interessante caso di epatite tropicale.—*Arch. Ital. Sci. Med. Colon.* 1927. July. Vol. 8. No. 7. pp. 367–374.

Iio (Junzo). [Un cas côlon-mobile simulant la dysenterie amibienne.]—*Jl. Oriental Dis. Infants.* 1928. Nov. Vol. 4. No. 3. [In Japanese. French summary pp. 29–30.] [Pediat. Inst., Imperial Univ., Kyoto.]

de Mello (Froilano) & Pachêco de Figueiredo (Francisco). Primeiras experiências de tratamento Yatrénico em dois casos de amebiase intestinal.—*Bol. Ger. Med. e Farmacia.* Bastora. 1928. Mar., Apr. & May. Ser. 12. Nos. 3, 4 & 5. pp. 29–33.

Menten (Maud L.) & Krugh (Helen M.). Insulin Content of the Pancreas following Intoxication of Rabbits with Paratyphoid B Filtrate and Dysentery Bacilli.—*Jl. Infect. Dis.* 1928. Aug. Vol. 43. No. 2. pp. 121–125. [2 refs.] [Path. Labs., Univ., Pittsburgh, Pa.]

Metzger (H.). Ueber eine Behandlungsmethode der chronischen Dysenterie bzw. der Colitis ulcerosa.—*Deut. Med. Woch.* 1928. Aug. 17. Vol. 54. No. 33. p. 1376. [1 ref.] [Municipal Hosp., Neukölln-Berlin.]

Niño (Flavio L.). A propósito del tratamiento de las infecciones por "Giardia intestinalis."—*Semana Méd.* 1928. Dec. 6. Vol. 35. No. 49 (1821). pp. 1616–1617.

Pirami (Ester). Sulla cistite amebica.—*Arch. Ital. Sci. Med. Colon.* 1928. Mar. Vol. 9. No. 3. pp. 143–165. [38 refs.] [Inst. of Trop. Path., Univ., Bologna.]

Pozzo (Fernando) & Olivân (Narciso). Absceso hepático amebiano en un niño de 12 años.—*Semana Méd.* 1928. Nov. 29. Vol. 35. No. 48 (1820). pp. 1483–1485. With 2 text figs.

Stern (E.). Behandlung der Amöbenruhr.—*Med. Klin.* 1928. Oct. 19. Vol. 24. No. 42 (1245). pp. 1627–1628.

Takeda (Shunichiro). [Examen des fonctions du foie chez les enfants souffrant de dysenterie.]—*Oriental Jl. Dis. Infants.* 1928. Nov. Vol. 4. No. 3. [In Japanese. French summary p. 24.] [Pediat. Inst., Imperial Univ., Kyoto.]

Yamashita (Hideo). [Un cas de tuberculose de l'intestin simulant la dysenterie.]—*Oriental Jl. Dis. Infants.* 1928. Nov. Vol. 4. No. 3. [In Japanese. French summary p. 29.] [Pediat. Inst., Imperial Univ., Kyoto.]

SPRUE.

Low (G. Carmichael). **Sprue : an Analytical Study of 150 Cases.**—*Quarterly Jl. Med.* 1928. July. Vol. 21. No. 84. pp. 523–534. [Hosp. for Trop. Diseases, London.]

The 150 cases which form the basis of this study were all treated in London during the last twenty years. The youngest patient seen was 21, the oldest 75 years of age ; when the age incidence is divided into periods, the maximum number of cases occurs in the middle period of life, from 30 to 60. More males than females were seen, 112 males to 38 females, but this does not necessarily imply that the female is less liable to the disease. The duration was computed in 113 cases : in 32 the illness lasted under one year ; in 2 over nine. As regards the place of infection, the majority came from India (68), especially Bombay (7), China (27), Ceylon, while others came from Malaya, Mesopotamia, East Africa (2), West Indies, British Guiana, Mexico, Fiji (1) and North Queensland (2). In 61 per cent. a history of some previous debilitating illness was obtained and a definite relationship could be traced. A definite connexion between hill diarrhoea and amoebic dysentery apparently exists, the one infection merging imperceptibly into the other. Syphilis is so frequent that a syphilitic " pseudo-sprue " seems to be produced which yields to anti-syphilitic remedies. In 14 only out of the series no tongue or mouth symptoms existed nor could a history of such be obtained. In 4 instances only were oesophageal symptoms present. The characteristic diarrhoea was present in all but 9 cases and, as is well known, the total faecal fat content is high ; in a native Indian case recorded it was as high as 67·86 per cent. Flatulence is a dominant symptom and was present in 50 per cent. In 42·2 per cent. marked shrinkage of the liver was noted. As regards the anaemia great variation was noted ; in 45 instances the red cells numbered from four to five million, while in 5 the blood count was normal. Only in those cases with great anaemia is a leucopenia noted. Other symptoms recorded are cachexia with pigmentation of the skin, mental changes, oedema of feet, pyrexia, dry atrophic skin, cramps in muscles, vomiting, appendicitis, haemorrhoids, petechial haemorrhages, cessation of menstruation, auricular fibrillation, syncope. Although tetany is described in text-books, the author has not seen it in this series. Treatment is conducted on familiar lines. For anaemia blood transfusion and the administration of arsenic either in the form of Fowler's solution or by injection, as arsenate of iron, is advocated. Treatment in hospital may have to be prolonged to 29 weeks. The end results of treatment are extremely difficult to estimate. The author considers himself justified in stating that out of 150 cases 22 were cured ; 60 were " satisfactory " ; 22 improved ; 16 not improved ; 10 died ; 20 were unaccounted for.

P. H. Manson-Bahr.

Zeiss (Heinz) & Popow (Peter). Die Spru in Russland. [**Sprue in Russia.**]—*Seuchenbekämpfung.* Vienna. 1928. Vol. 5. No. 4. pp. 225–232. With 3 coloured figs. on 1 plate. [30 refs.] [Tarassewitsch Inst. Experim. Therap. & Serum Control, & Trop. Inst., Moscow.]

The authors' attention was drawn to indigenous sprue in Europe by the articles of Hess-Thayssen. Having satisfied themselves with a

definition for the diagnosis of sprue and especially the meaning of Thayssen's fatty-diarrhoea, they consulted the literature and found some 23 indigenous cases of sprue have been chronicled in Russia since 1921. The geographical distribution is somewhat restricted and includes subtropical Central Asia, Turkmenistan, Tashkent, Bukhara, Soviet Armenia and Tiflis. The extremes of temperature in these various districts, which in Tashkent varies from —26·7° C. in winter, to 42·6° C. absolute maximum in summer, bear out the reviewer's contention that the incidence of sprue is not entirely dependent upon temperature. Most of the patients were of middle age, the youngest 14, the oldest 67. As has been noted further East the disease attacks the lighter-skinned races, the darker complexioned Bnkharans, Armenians and Georgians escaping entirely.

Stress is laid on the typical picture of the anaemia of sprue, and of the appearances of the tongue, which are illustrated by three figures. The authors regret that so far, only two practitioners have undertaken to investigate the remarkable blood picture of sprue in Russia. The details of the 2 autopsies performed are also very meagre. They find it difficult to accept any deficiency as the predominating aetiological factor in sprue as Russians are well-known vitamin consumers. Finally, they advocate a world-wide investigation of sprue by experts in many lands based on a prearranged plan.

P. H. M-B.

Antoine (Edouard). Trois cas de diarrhée grave à allure de sprue. Étude de cette affection tropicale. [**Three Cases of Grave Sprue-like Diarrhoea. Study of Sprue.**]—*Arch. des Malad. de l'Appareil Digestive.* 1928. Jan. Vol. 18. No. 1. pp. 45–65.

This study of sprue follows the now familiar lines whilst detailing the researches directed towards disentangling the true etiology of the disease. The three cases described are typical, two from Cuba and one from Mexico, all with a considerable degree of anaemia. With repeated blood transfusions and a dietary of calf's liver recovery was rapid, remarkable and permanent. All three have now remained cured for 2–3 years and have returned to Central America. The remainder of the paper contains an excellent résumé of modern methods of medicinal and dietetic treatment.

P. H. M-B.

Fairley (N. Hamilton), Mackie (F. P.) & Billimoria (H. S.). **Anaemia in Sprue. An Analysis of 67 Cases.**—*Indian Jl. Med. Res.* 1929. Jan. Vol. 16. No. 3. pp. 831–860. With 5 plates (1 coloured). [3 pages of refs.] [Haffkine Inst., Bombay.]

From an analysis of 67 cases of sprue the authors have concluded that the red blood corpuscles averaged 3,242,000, the haemoglobin 65·5 per cent. and the colour index 1·0 for the whole series. At the onset the anaemia of sprue is rarely so severe as that met with at a corresponding stage in pernicious anaemia and during its course a severe grade of anaemia less frequently develops. Only 17·9 per cent. of the cases show red cell counts of under 2,000,000, though in two exceptional instances counts of 575,000 and 400,000 per cmm. were recorded. Throughout all stages of the disease 61 per cent. of the cases showed a colour index equal to, or exceeding, unity, while in the

remaining 26, values of from 0·8 to 0·99 were recorded in 19. The blood picture remained perfectly constant, anisocytosis constituting an outstanding feature; microcytes were rare; poikilocytosis and polychromasia, while occurring, are nothing like so marked as in pernicious anaemia. Nucleated red cells were rarely seen. In uncomplicated sprue the leucocyte counts were either normal or there was a leucopenia sometimes associated with a lymphocytosis. Leucocytosis as indicative of some intercurrent infection was observed in 5 out of 60 cases investigated.

A blood crisis is described in sprue and is characterized by a rapid and critical fall in the haemoglobin and red cells. It is generally associated with severe diarrhoea and progresses to a fatal issue without remissions and without corpuscular regeneration so typical of the crisis in pernicious anaemia.

Price-Jones curves were investigated in 11 cases of well-established sprue and closely resembled those in pernicious anaemia, being characterized by marked symmetry and a definite increase in the mean diameter of the corpuscles. Essentially the anaemia is of the megalocytic type.

Van den Bergh readings showed that 54·17 per cent. of cases gave readings under 0·6 units, 72·9 per cent. under 0·8 and 91·7 per cent. under 1·2. Hyperbilirubinaemia is more frequent in pernicious anaemia and malaria than in sprue. Deferred blood production, rather than excessive blood loss, constitutes the basis of sprue anaemia. The process commences in an ill-nourished bone-marrow which, poisoned by sprue toxin of alimentary origin, undergoes primary hypertrophy and a secondary atrophy.

P. H. M-B.

SERRA (Américo). **The Relation of Sprue to Pernicious Anemia with a Report on Blood Changes in 45 Cases of Sprue.**—*Amer. Jl. Trop. Med.* 1929. Jan. Vol. 9. No. 1. pp. 49–65. [32 refs.] [Presbyterian Hosp., San Juan, & School of Trop. Med., Univ., Porto Rico.]

Forty-five cases of sprue are discussed in this paper, of which twenty-six were males and nineteen females. Thirty-eight were white and seven coloured, ranging in ages from 9–69 years.

The large majority of sprue patients lose weight while those suffering from pernicious anaemia exhibit little or no wasting, especially of the subcutaneous fat.

Symptoms referable to spinal cord involvement are present in 70 per cent. of cases of pernicious anaemia. In sprue definite cord symptoms are rare.

All are agreed that as sprue progresses the liver becomes small and atrophic, while in pernicious anaemia the organ is either enlarged or remains normal in size.

Fever is present at one time or another in over two-thirds of cases of Addisonian anaemia, but was present in only 20 per cent. of this series of sprue cases.

Examination of the gastric contents probably constitutes the best single method of differentiation between the two diseases. In this series of fractional gastric aspirations in 25 sprue patients, achlorhydria was found in only three instances, while four showed abnormally high

acid values. As the patient improves and the blood rises to normal, free acid again appears in the gastric contents. The icteric index is obtained by comparing the unknown serum against a 1 : 10,000 solution of potassium bichromate as a standard. In six cases of sprue the icteric index ranged from 3 to 5, whereas in uncomplicated pernicious anaemia it ranged from 8 to 12·5.

In this series of 45 sprue cases, 40 or 89 per cent. showed a colour index of 1 or higher, while of the remaining five cases only two had indices below 0·9. The average index for the series was 1·23. In sprue, as in Addisonian anaemia, the rule is that the colour index varies conversely with the red blood count; thus the lower the count the higher the index and *vice versa*.

Both sprue and pernicious anaemia are accompanied by definite leucopenia with a relative leucocytosis at the expense of the polymorphonuclear neutrophils, eosinophiles and monocytes. In this series the average leucocyte count was 4,880 with 55 per cent. neutrophiles. In sprue anaemia with marked anisocytosis the macrocyte is the predominant cell. The average in fourteen cases ranges from 7·6 to 8·9 microns. In forty-five sprue cases normoblasts were found in less than 30 per cent., while megaloblasts were present in one case only and this during the course of a blood crisis three or four hours before death.

P. H. M-B.

Ashford (Bailey K.). **Certain Conditions of the Gastro-Intestinal Tract in Porto Rico and their Relation to Tropical Sprue.**—*Amer. Jl. Trop. Med.* 1928. Nov. Vol. 8. No. 6. pp. 507–538. [1 ref.] [Columbia Univ., & School of Trop. Med., Univ. of Porto Rico, San Juan, Porto Rico.]

Digestive incompetence is very common in Porto Rico; such patients describe themselves as "bilious" or "*indigestos*." Sprue is an urban disease in contrast to pellagra. Full-blooded negroes appear to be immune to sprue. In the acid contents of the bowel the ever-present saprophyte, *Monilia psilosis*, finds an enriching medium in which to multiply and becomes a facultative parasite. Family incidence of the disease is one of its characteristics. Acute sprue is comparatively frequent. There is usually a sharp attack of indigestion with much gas formation, cramps and foetid diarrhoea; after a period of intermission a rapidly advancing severe attack of sprue follows. Some time afterwards the classic picture of sprue develops.

The remainder of the paper is occupied by the reiteration of the claims of *Monilia psilosis* to be considered an aetiological factor in sprue.

P. H. M-B.

Miguens (J.). Observation clinique d'un cas de sprue au Katanga. [**Case of Sprue in the Katanga.**]—*Bull. Méd. du Katanga.* 1928. Vol. 5. No. 3 & 4. pp. 45–55. [9 refs.]

Dr. Miguens was consulted by a European patient who had lived for 40 years on the Congo almost without interruption since nine years of age. He complained of symptoms strongly reminiscent of sprue. The tongue was typical and the diarrhoea consisted of five or six typical motions daily. Embryos of *Strongyloides stercoralis* were found in the faeces, but subsequent to thymol treatment their numbers became sensibly diminished and the

condition of the patient much improved. The author believes this to be the first case of sprue described from the Belgian Congo and further that the Strongyloides may play an etiological role.

P. H. M-B.

Hegler (C.). Zur Frage der einheimischen Sprue. [**Indigenous Sprue.**]—*Deut. Med. Woch.* 1928. Sept. 7. Vol. 54. No. 36. pp. 1505–1507. [18 refs.] [St. George's General Hosp., Hamburg.]

Hegler relates details of a case which occurred in his practice. The patient was a lady, 49 years of age, who had never been out of Germany, with excoriation of the tongue and mouth, and was first seen in 1921. Early in 1922 aphthous ulcers appeared on the tongue and buccal mucosa, dyspeptic symptoms supervening. A moderate anaemia with erythrotic changes followed. The clinical picture suggested an early Addisonian anaemia. Soon, however, diarrhoea set in and wasting became apparent. In May, 1923, she presented the picture of a well-established pernicious anaemia, with 1,100,000 red cells, and emaciation had become extreme. In August, 1923, in spite of repeated blood transfusions and arsenic injections, the weight had fallen to 38 kgm. The tongue still remained intensely red with aphthous ulceration. A disquieting point in the diagnosis was the high coloured, liquid, fatty stool. The complete achylia and blood picture still suggested pernicious anaemia. A colleague from the East suggested sprue as the correct diagnosis and consequently a sprue dietary with Plasmon and fruit was instituted. In July, 1924, the patient was treated with Uzara tablets and almost immediately a remarkable improvement became manifest. The weight increased to 60 kg. and the general health improved to the extent that the patient is now capable of eating anything. For the last two years she has been in normal health. The Uzara in this case appears to have had a specific effect. The differential diagnosis between sprue and pernicious anaemia is discussed at some length.

P. H. M-B.

Ashford (Bailey K.). **An Evaluation of Liver Extract in the Treatment of the Anemias of Sprue. Preliminary Note.**—*Jl. Amer. Med. Assoc.* 1928. July 28. Vol. 91. No. 4. pp. 242–244. With 4 charts in text. Also in *Porto Rico Rev. of Public Health & Trop. Med.* 1928. Aug. Vol. 4. No. 2. pp. 78–80.

Twenty cases of typical sprue, fourteen with the blood picture of pernicious anaemia and six with a secondary type of anaemia, were selected for the purposes of this study. As a control four cases showing no sprue symptoms but with a secondary type of anaemia were selected. Of the twenty sprue patients fourteen were placed on a sprue dietary and received in addition three to six vials of Eli Lilly & Company's liver extract daily. Of the remaining six four were treated by diet alone, while one received the diet plus *Monilia psilosis* vaccine, and the remaining one vaccines without dietetic restrictions or liver extract. Blood data were taken before, during, and after a course of liver extract. In normal persons at San Juan, Porto Rico, it is estimated that the average reticulocyte percentage is 0·18. In estimating the reticulocytes a thousand erythrocytes were classified by means of a mechanical stage and a ruled disc in the microscope eyepiece. On receiving liver extract five anaemic sprue cases immediately responded and the average

haemoglobin rose from 23 to 93 per cent. The average reticulocyte curve rose to 162 per thousand erythrocytes in a period of twelve days. In one of these patients two blood transfusions had completely failed to raise the blood value. Five others showed an incomplete response, but they had been eating liver in a desultory sort of way for some time previous to the administration of the extract. No increase of reticulocytes was seen in the four patients with secondary anaemia. Of the four patients treated by diet alone the reticulocyte percentage started to rise on the fifth day and reached 104 per thousand erythrocytes on the eleventh day. In the last two patients with sprue and severe anaemia treated with and without vaccines the reticulocyte response was small and inconclusive, while the four secondary anaemias used as controls showed no response at all.

Ashford concludes that sprue anaemias with a high colour index and less than two million erythrocytes are sure to yield a shower of reticulocytes when Minot's liver fraction is administered, unless the bone marrow is hypoplastic. On the other hand, an erythrocyte percentage of more than 60, despite a high colour index has so far shown no appreciable increase in reticulocytes. A sprue dietary likewise produces a reticulocyte shower, but the response is by no means so speedy or so well sustained as after the administration of liver extract.

P. H. M-B.

Richardson (Wyman) & Klumpp (T. G.). **Sprue. Report of a Case treated with the Authorized Liver Extract Effective in Pernicious Anemia.**—*New England Jl. of Med.* formerly *Boston Med. & Surg. Jl.* 1928. Aug. 2. Vol. 199. No. 5. pp. 215–218. With 1 fig. [9 refs.]

A study of a case of sprue originating five years previously in China. The case has claim to serious consideration in the remarkable response the blood showed to an extract of liver, comparable to that reported in similar cases fed on large amounts of whole liver.

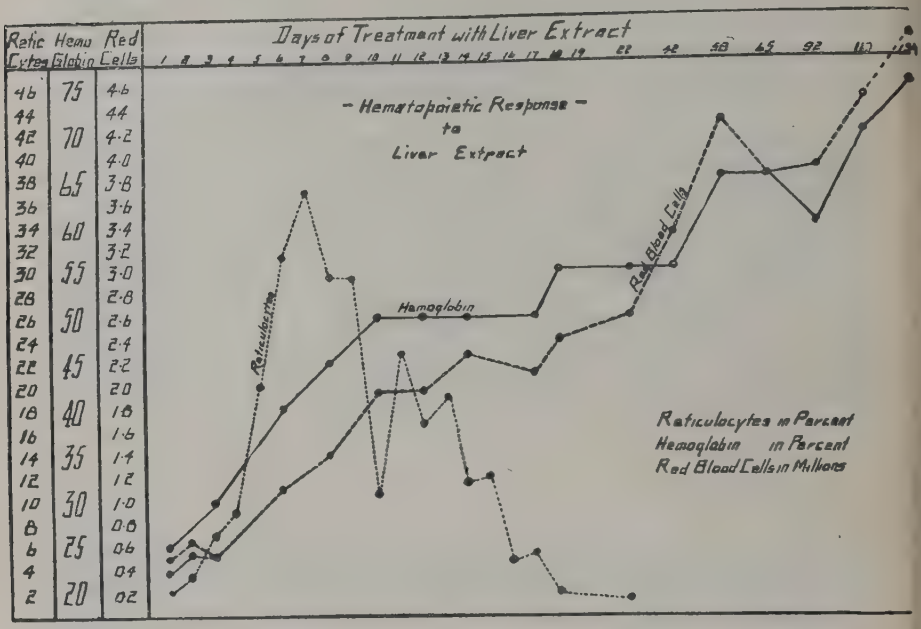
On admission in November, 1927, the patient was practically moribund. The tongue was smooth and atrophic; the blood pressure registered 100/55; there was slight oedema about the ankles. The blood count was 376,000 per cmm., of which 2 per cent. were reticulocytes. The haemoglobin was 25 per cent. Other blood changes indicating a severe haemolysis were present. The blood serum calcium was 9·8 milligrammes per 100 cc. blood. Gastric analysis showed free hydrochloric acid equivalent to 29·2 cc. The stools were typical of sprue.

The commercial extract—an amount derived from 200 grammes of liver (Eli Lilly & Co., Liver Extract No. 343)—was given three times daily in water between meals. The treatment was confined to the one essential liver-extract.

The response was magical. In sixteen days the patient was able to sit up in a chair and at the end of twenty he was well enough for discharge. The stools showed a similar gratifying response. On discharge the patient daily took extract derived from 300 grammes of liver. When last seen on March 22nd, 1928, the red blood count was 5,000,000 per cmm. The patient was then told to take daily extract derived from 200 grammes of liver.

The differential diagnosis between sprue and pernicious anaemia is debated.

The rapid improvement of gastro-intestinal symptoms were entirely unexpected. The rise in reticulocytes began on the third day after the liver extract and reached a peak of 37 per cent. on the seventh day. The total red blood cell rise began with the reticulocyte rise and was very rapid (vide chart).



BONE MARROW RESPONSE TO LIVER EXTRACT IN A CASE OF SPRUE

RETICULOCYTES IN PERCENT
RED BLOOD CELLS IN MILLIONS
HEMOGLOBIN (TALLQUIST) IN PERCENT

[Reproduced from *New England Journal of Medicine.*]

It is interesting that liver soup has been an old native remedy for sprue in Ceylon and has been advised as a routine treatment for sprue in the Hospital for Tropical Diseases, London.

P. H. M-B.

BLOOMFIELD (Arthur L.) & WYCKOFF (Harry A.). **The Treatment of Sprue with Liver Extract (343).**—*Amer. Jl. Med. Sci.* 1929. Feb. Vol. 177. No. 2 (683). pp. 209–213. With 2 charts. [5 refs.] [Med. School, Stanford Univ., San Francisco.]

The present report deals with two further cases of sprue in which satisfactory remission was obtained by Liver Extract 343 (Lilly). [see this *Bulletin*, Vol. 25, p. 691.]

The intensive use of liver was suggested by the similarity of sprue and pernicious anaemia.

The first patient received a preliminary transfusion of 600 cc. of citrated blood, but that this played no part in the subsequent course is suggested

by the fact that the blood count was falling when the liver extract was first given. The liver extract was equivalent to 400 to 600 gm. daily. There was a gain of 30 lbs. in weight and the blood count rose from 740,000 red cells to 5,000,000. The second case, which was of three years duration, was in a Spanish labourer who had lost much weight. The red blood cells were 2,000,000, the haemoglobin 50 per cent. The patient, restricted to bed, was given for two days a liver extract equivalent to 4,800 gm. of liver in divided doses. On the third day a typical reticulocyte response began followed by a rapid rise in the red cell count. In spite of the complication of perirectal abscess, the patient left hospital in less than five weeks from the beginning of the treatment very much improved.

The results obtained with liver extract are comparable with those seen in pernicious anaemia.

P. H. M-B.

West (Randolph). **The Response of Sprue Anemia to Liver Extract.**—*Porto Rico Rev. of Public Health & Trop. Med.* 1928. Nov. Vol. 4. No. 5. pp. 219–220. [College of Physicians & Surgeons, Columbia Univ., New York.]

It has been shown that the material in liver active in pernicious anaemia is soluble in water and in 70 per cent. alcohol, but insoluble in absolute alcohol and ether. It is presumably an organic base and contains nitrgoen. Seven cases of sprue anaemia treated with known potent liver extract gave interesting responses. Three cases with red blood cell counts of about one million responded well with large and rapid formation of reticulocytes. The remaining four cases with red blood cell counts ranging from 1,700,000 to 2,300,000 gave either very weak responses or none at all. It would appear that not all cases of sprue respond to liver extract with a rise in reticulocytes.

P. H. M-B.

Facio (A. A.). **Liver and Special Diet in the Treatment of Anaemias.**—*Sixteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1927. pp. 176–179. [United Fruit Company Hosp., Limon, Costa Rica.]

During the year 1927, Facio has had under his care several cases of anaemias of different types which have responded miraculously to the liver treatment and a properly balanced diet.

At the beginning of treatment of one patient he weighed only 114 lb.; he now weighs 142. The illness resembled sprue in its main features, with sore mouth, dyspepsia and frothy diarrhoea. The eating habits had been most irregular and the diet had consisted of carbohydrates and artificially sweetened foods. Half a pound of partially cooked ox or calf's liver was eaten daily. For the achylia, 10 drops of diluted nitrohydrochloric acid were given three times daily. After 25 days of this treatment the patient's general condition improved and the blood condition returned to almost normal within four months.

P. H. M-B.

Mackie (F. P.), Goré (S. N.) & Wadia (J. H.). **The Bacteriology of Sprue.**—*Indian Jl. Med. Res.* 1928. July. Vol. 16. No. 1. pp. 95–108. [7 refs.]

Since 1924, 92 specimens of sprue stools and 6 of duodenal contents from sixty cases of sprue at different stages of the disease have been

examined. It had been hoped by the study of the various intestinal organisms to arrive at a true picture of the bacterial flora and to find some organisms constantly occurring which might be definitely associated with the disease. These hopes have not been realized; although the scarcity of protozoa has been remarked upon. In no single instance was *Entamoeba histolytica* or its cysts seen. Flagellates were seen twice, and the scarcity of these organisms is attributed to the high degree of acidity of sprue stools. The pH was found to be as low as 3·5, rarely as high as 6·0, a factor which probably accounts for the scarcity of the dysentery group as well. Yeasts were almost invariably present with fat globules. Cultures made from the circulating blood from 30 cases of sprue were sown on a variety of laboratory media. In two cases only was a bacterium, named provisionally *B. gomezi*, isolated, an organism which was found once in the duodenal contents of an early and acute case.

In considering more minutely the bacterial flora, a large number of tables and protocols are given, about which it was not possible to arrive at any definite conclusions. An atypical strain resembling *Bact. dysenteriae* Flexner was found once, *Bact. dysenteriae* Strong once and organisms resembling *Bact. morgan, carolinus, columbiensis* and *asiaticus*, organisms of doubtful pathogenicity, were each isolated on a few occasions. Haemolytic, gas-producing, anaerobic bacteria were invariably present when suitable cultures were made, but since these organisms are almost always present in normal stools the observation has little significance. Of the duodenal contents, one case yielded five types of bacteria; one, four; three, three; and two, two. A haemolytic streptothrix was present in two cases. The cocci obtained from the duodenum were haemolytic.

The authors conclude that the bacterial flora of the duodenal contents of sprue is of special significance, as none of the organisms could be definitely identified with the recognized general pathogenic bacteria found in the intestinal canal in other diseases.

P. H. M-B.

Mackie (F. P.) & Chitre (G. D.). **The Association of Bowel Disease with Vitamin C Deficiency.**—*Indian Jl. Med. Res.* 1928. July. Vol. 16. No. 1. pp. 77–94. With 19 figs. on 4 plates (1 coloured) & 2 charts. [6 refs.]

It was endeavoured to reproduce the clinical features of sprue in monkeys fed on a diet deficient in Vitamin C. It was found that avitaminosis in itself produced an increase susceptibility to disease of the intestinal tract.

The authors used 16 monkeys in two batches. The first batch of 10 included four controls which were fed on a normal diet and did not receive infected material, *i.e.*, saline suspension of cultures and sprue faeces. The 6 monkeys on a deficiency diet received infective feeds of sprue material. All developed an inflammatory or degenerative condition of the alimentary tract resembling dysentery. In the second batch of experiments, all 6 monkeys were maintained on a deficiency diet, but the 3 controls received no infective feeds. All developed the same clinical symptoms and all showed the same post-mortem changes. It was therefore assumed that the vitamin C deficiency was responsible for the symptoms and not the infective feeds.

The symptoms and progress of this vitamin deficiency disease in monkeys, as well as the post-mortem signs and the morbid histology, agree very closely with that described by McCarrison (1919); the only difference being that in the latter series the duodenum and upper part of the small intestine were equally affected with the large, whereas in the present series the upper part of the alimentary canal was almost always free from disease.

The paper is furnished with a large number of details in the shape of protocols and tables of the bacteria present in the faeces of these monkeys. The three accompanying plates of photomicrographs which illustrate the pathological changes in the intestinal canal resemble those of acute bacillary dysentery rather than those of sprue.

P. H. M-B.

Mackie (F. P.) & Chitre (G. D.). **Animal Experiments and Sprue.**—*Indian Jl. Med. Res.* 1928. July. Vol. 16. No. 1. pp. 49–75. With 6 figs. on 1 plate. [7 refs.]

This paper records experiments with different monilias recently isolated from cases of sprue, mostly of the species *M. psilosis*. Others were irregular strains, and others *M. kruzei*, a type of wild yeast. Strains of *M. psilosis* were obtained from Col. Ashford's laboratory and from the National Collection of Type Cultures.

The experiments were classified as follows: the result of a single intraperitoneal injection of yeasts into guineapigs; the results of multiple intravenous injections into rabbits of yeasts derived from various sources; feeding experiments; miscellaneous experiments utilizing intralingual, intrathoracic and intravenous inoculations. Further experiments were designed to ascertain whether the virulence of a strain of monilia could be enhanced by frequent passage through a succession of guineapigs. The injection of duodenal fluid from cases of sprue into rabbits was made without ascertainable results.

Having failed to produce signs of sprue in normal animals, they attempted to do so in animals suffering from vitamin C deficiency. Monkeys, mostly *Macacus sinicus*, were chosen and were kept till they showed a loss of weight and other signs of scurvy. Six out of a series of 10 died of dysenteric symptoms which were the result of the scorbutic state. In none was monilia found in the blood stream or viscera and none showed any sprue-like symptoms during life.

The conclusions go to show that when *M. psilosis* and other species of monilia are injected by the peritoneal route, a small proportion of animals die of localized peritonitis, with or without a generalized septicaemia. No exaltation of virulence results from passage of *M. psilosis* through a series of animals. Feeding experiments were entirely negative and sometimes in the faeces of healthy animals monilia indistinguishable from *M. psilosis* of Ashford were obtained. Finally, sprue has not yet been reproduced in monkeys or other laboratory animals.

[The net result of these experiments confirm in a remarkable manner the reviewer's work in Ceylon in 1913 in which extensive investigations on yeasts were undertaken. See "Researches on Sprue in Ceylon," 1915, p. 144. Appendix 14B.]

P. H. M-B.

MACKIE (F. P.) & FAIRLEY (N. Hamilton). **The Morbid Anatomy of Sprue.**—*Indian Jl. Med. Res.* 1929. Jan. Vol. 16. No. 3. pp. 799–825. With 7 plates (2 coloured). [18 refs.] [Haffkine Inst., Bombay.]

The material for this study was derived from eight autopsies mostly on Eurasians. The authors are not inclined to stress unduly the weights of the various viscera, because of factors which are difficult to assess in comparing them with standard weights as given in text-books. In seven advanced cases of sprue a condition of semi-starvation had existed over long periods and it is well recognized that in starvation the fall of weight is not in equal proportion in all viscera. The small heart often met with in this disease may have a special value in differentiating between sprue and pernicious anaemia. The heart may weigh as little as 2½ oz. The decreased size of the liver does not of necessity imply a specific atrophy, but is rather related to chronic starvation in which depletion of the glycogen store is consequent upon deficient carbohydrate intake.

In the emaciated body such traces of fat as may remain are generally of normal appearance and not of the lemon-yellow colour of pernicious anaemia. The tongue is wasted and its surface atrophic—the latter usually in association with the disappearance of the lingual papillae. When the abdomen is opened the intestines are emptied and collapsed, though there may be balooning of some coils of the small bowel. Often the intestines appear tenuous and semitransparent and sometimes of a pinkish colour due to injection of the small vessels with blood. The mucous lining of the oesophagus may be thin and pale with patchy injection of surface vessels, but it shows little that is abnormal. Actual ulceration of the mucosa of the stomach or intestines is uncommon. Once superficial erosions were noted, and on another occasion an isolated superficial healing ulcer about half-inch in diameter was met with four inches above the ileo-caecal valve.

The bone-marrow received special attention. In this series the femur was examined in three instances, the tibia in five. There was evidence to show that the bone-marrow, under the stimulus of some haemato-poietic toxin passes through a hyperplastic stage, but in the late and terminal phase the erythroblastic response fails with the production of the hypoplastic or aplastic condition of the marrow. This is borne out by the blood pictures of aplastic anaemia so often observed during life.

In every case sections of the tongue have been stained specially for Monilia and in a few instances penetration of the mucosa with hyphae of Monilia have been seen.

With all precautions to avoid post-mortem decomposition, sections of the intestines were studied. The authors are inclined to the view that sprue is essentially a disease of the intestinal tract and that atrophy of the epithelium is at least a contributory factor in the evolution of the disease. Bacterial invasion of the mucous and submucous coats occurs and it seems that chronic poisoning by such bacteria must play some part in the clinical syndrome. The most noticeable changes are in the villi which show an infiltration with round cells and a degeneration of the epithelial covering. Eventually the villus becomes shrunken and acellular, a condition they describe as "withering of the villus." The remains of blood pigment are frequently seen in the subvillous layers.

These findings suggest a specific virus acting on the intestinal tract resulting in degeneration, atrophy and diminished resistance of the mucosa to microbic invasion. Haemosiderin probably constitutes only a proportion of the pigment deposit in sprue, the nature of the remainder not having been determined. Iron pigment in limited quantity was demonstrated in the kidneys, lymph glands, intestinal wall and spleen. In view of Scott's theory of parathyroid deficiency in sprue, the parathyroid gland was dissected out in three cases, but presented no abnormality on microscopic section. The lymphatic system including the receptaculum chyli was examined minutely in one case, but no abnormality or interference with the lymph flow was detected.

Finally, the authors believe that sprue is primarily a disease of the intestinal tract which, if progressive, results ultimately in degeneration and destruction of the absorbing and secretory tissues and the production of slow progressive starvation.

P. H. M-B.

Mackie (F. P.). **The Microscopical Changes occurring in Organs after Death.**—*Indian Jl. Med. Res.* 1929. Jan. Vol. 16. No. 3. pp. 827–830. With 3 plates. [Haffkine Inst., Bombay.]

During a study of the changes in the intestines in sprue cases it was realized that some of the appearances described might be due to decomposition. The author therefore made a series of observations on the organs of monkeys, portions of the liver, kidney and intestines of which were taken for section three, six, nine and twenty-four hours after death respectively. Absolutely fresh material was used as control. The observations showed that microscopic changes due to putrefaction in these organs are discernible three hours after death at room temperature (75° F.). The first changes are in the epithelial cells of the kidney and of the intestine and can be recognized by the granular characters of the cytoplasm, and by the swelling and indistinctness of the nuclei. As putrefaction proceeds, the epithelial cells and parenchyma cells of the liver gradually break up and lose their outlines. Intestinal bacteria begin to penetrate the intestinal mucosa about nine hours after death and putrefactive bacteria are met with in increasing numbers after this time. A study of these changes enables one to distinguish those which have been observed in the intestine as the result of disease.

P. H. M-B.

Mackie (F. P.) & Goré (S. N.). **A Note on an Unrecognized Bacillus Isolated from Sprue Cases.**—*Indian Jl. Med. Res.* 1928. Oct. Vol. 16. No. 2. pp. 275–280. With 18 figs. on 2 plates.

The organism, provisionally named *B. gomezi*, was first isolated from the duodenal contents collected during life by the duodenal tube in a patient who was the subject of an early and acute attack of sprue. It was subsequently found in pure culture in the circulating blood of two more cases of well defined sprue. The three strains were identical in reaction. It was not, however, demonstrated in the duodenal contents of seven other cases of sprue nor in the circulating blood of some thirty others ; neither was it agglutinated by the blood serum of

either of the cases from which it was isolated in dilutions of more than 1 : 20, nor by the serum of a few other cases of well defined sprue. In mice it exerts feeble pathogenic powers, but not in other laboratory animals.

The organism is gram-negative and non-acid-fast ; in sugar media it produces acid in glucose and maltose. Cultures of the organism sent to the Lister-Institute were investigated and it was suggested that the organism was allied to *bronchisepticus* or perhaps the *mallei* group.

The pleomorphism of the organism at first suggested that there might be an admixture of strains, but this is not so. The relationship of the organism to sprue, though its presence is suggestive, is by no means considered certain at this stage.

P. H. M-B.

Costa (Mandry O.). **Immunological Investigations on Tropical Sprue in Porto Rico. VI. A Study of the Aerobic Flora of the Stools of Cases of Tropical Sprue. VII. Agglutinins in the Blood in Tropical Sprue for Organisms of the Colon-Typhoid-Dysentery Group.**—*Porto Rico Rev. of Public Health & Trop. Med.* 1928. Nov. Vol. 4. No. 5. pp. 212–218. [12 refs.] [School of Trop. Med., Univ., Porto Rico.]

The results obtained from bacteriological examination of the stools of 20 sprue patients were compared with those previously obtained from a study of normal faeces. No marked difference was observed. The finding of *Lactobacillus acidophilus* in two cases of sprue can be explained by the fact that these patients were on a strict milk diet and had taken acidophilus milk. It was possible to isolate organisms belonging to the coli (Escherichia) group. No true dysentery bacilli were found in any of the cases examined. With antigen prepared from 13 strains of organisms the serum of the sprue patients was tested. In both series (*i.e.*, the sprue cases and controls) there were cases in which agglutinins for typhoid or paratyphoid bacilli were present. The net result of the investigation is to the effect that the bacteriological findings in sprue cases do not differ markedly from those of normal controls.

P. H. M-B.

Weiss (Charles) & Landrón (Francisco). **Immunological Investigations on Tropical Sprue in Porto Rico. 4. The Biology of *Monilia psilosis* in Relation to Sprue.**—*Jl. Infect. Dis.* 1928. Dec. Vol. 43. No. 6. pp. 557–564. With 1 text fig. [14 refs.] [School of Trop. Med., Univ., Porto Rico.]

During a two years' stay in Porto Rico, the authors undertook an investigation upon the biology of *Monilia psilosis*. The optimum pH for growth is found to be about pH7 ; for Saboraud agar the optimum is at pH6. *M. psilosis* can be readily killed by heating at 56° C. for ten minutes.

The isolation of *M. psilosis* from the faeces is greatly facilitated by the use of glycerol and bile to inhibit the growth of common faecal bacteria. With this technique the fungus has been obtained from a large percentage of sprue cases and controls. The observations upon the optimum conditions for growth are in harmony with the idea that an increased acidity of the intestinal contents favours the establishment

of the fungus in patients attacked by sprue. Intravenous injection of *M. psilosis* kills rabbits in a few minutes up to 48 hours, with visceral embolic lesions. *M. albicans* and a Cryptococcus of blastomycosis act similarly. These monilia contain endotoxins which are not haemolytic and are not specifically antigenic when tested intradermally on immunized rabbits.

These observations do not support the theory that *M. psilosis* is an aetiological factor in sprue.

P. H. M-B.

Weiss (Charles). **Recent Literature on Tropical Sprue.**—*Arch. Pathology.* 1928. Nov. Vol. 6. No. 5. pp. 885–899. [66 refs.] [School of Trop. Med., Univ., Porto Rico.]

This paper does not call for a review, being itself merely a résumé of the literature of sprue, all of which has received notice in the *Bulletin*.

P. H. M-B.

TROPICAL OPHTHALMOLOGY:

A REVIEW OF RECENT ARTICLES.—XI.*

EYELIDS.—*Amyloid Degeneration.*—GABRIÉLIDÈS[1] reports a case of amyloid degeneration which affected the upper lid of one eye. The patient was a syphilitic woman aged 35, and was eight months pregnant. Albuminuria and exudative retino-choroiditis were present. Premature labour set in shortly after her admission and she was delivered of a dead foetus. Swelling of the lid had been noticed five years previously. She recovered her general health and the swollen mass of lid tissue was successfully removed. Pathological examination proved it to be the subject of amyloid degeneration with bony changes.

CONJUNCTIVA.—*Recurrent Pterygium.*—Meyer WEINER[2] has reviewed the various forms of treatment recommended for recurrent Pterygium. He regards an epithelial graft as the only really satisfactory treatment. A thorough dissection of the growth is made and special care is taken to remove all possibly affected corneal tissue near the apex of the growth. A graft as thin as possible is taken from the inner side of the arm and is transferred direct from the razor to the raw area. It is spread out evenly and its edges are slid beneath the undermined conjunctiva for a distance of 4 or 5 millimetres. No stitches are inserted. If the rather unsightly appearance of the epithelialized area is objected to, the graft may be removed after an interval of six months or more.

Phlyctenular Conjunctivitis.—LIAN[3] states that he has found phlyctenular conjunctivitis to be rare in the Dutch East Indies. He seldom meets with typical cases of the disease showing the usual symptoms of photophobia and blepharospasm. Also it is more common in adults than in children. He has found tuberculous affections generally to attack those in the more advanced stages of life than in early childhood. He recognizes the part played in the causation of the disease by a low general state of health and he thinks that tropical glare may also have some influence.

Trachoma.—KUSAMA[4] states that trachoma affects between 11 and 12 per cent. of the population in China. Notification of the disease is, however, still not compulsory although it constitutes practically 15 per cent. of all causes of blindness and is nearly as mischievous as gonorrheal ophthalmia. Conscripts are the most affected, then the primary school children. Factory employees and workers in restaurants, etc., show a comparatively lower rate. The disease is more common among female students than among males. Kusama suggests that this may be because the female engages to a greater extent in domestic work. For the diminution and amelioration of the plague the most important measure recommended is proper education so as to ensure full

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* For the tenth of this series see Vol. 25, pp. 990–995.

[1] GABRIÉLIDÈS (D.). Dégénérescence amyloide de la paupière.—*Ann. d'Oculistique.* 1928. Aug. Vol. 165. No. 8. pp. 575–581. [36 refs.]

[2] WIENER (Meyer). Treatment of Recurrent Pterygium.—*Amer. Jl. Ophthalm.* 1928. Nov. Vol. 11. No. 11. pp. 876–878. [19 refs.]

[3] LIAN (Sie Boen). Eenige opmerkingen omtrent de Conjunctivitis phlyctaenulosa in de tropen.—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1928. Vol. 68. No. 7. pp. 1074–1081. [13 refs.]

[4] KUSAMA (Hiroshi). The Prevalence of Trachoma and its Preventive Measures n Japan.—*Japan Med. World.* 1928. June 15 & July 15. Vol. 8. Nos. 6 & 7. pp. 154–161; 176–183. With 4 diagrams. [22 refs.]

co-operation of the population. Publicity is of vital importance and every endeavour should be made to educate the public by means of pamphlets, posters, leaflets, moving pictures and lectures on trachoma.

Bakker[5] has found 22 per cent. of school children at Serang (Java) infected by trachoma. At Bodjonegoro, which is about 15 miles from Serang, the percentage of infected children reaches 42. This seems to be due to the bad sanitation and the author thinks that the very polluted water used for ritual washings in the mosques is the most important factor in spreading the disease. Many children show a folliculosis which may readily cause errors in diagnosis.

Solares[6] reports that trachoma is comparatively rare in Bolivia. Indeed, it was believed to be non-existent prior to 1913. In 1916, however, a mild epidemic occurred amongst school children at Sucre. Excluding those then attacked he has only met with 99 cases, and these were evidently of very low virulence since pannus was only observed in two patients. Wilson[7] reviewing the evidence as to the association of trachoma and tuberculosis, thinks the relationship between the diseases in Egypt cannot be very intimate. He feels, however, that the corneal complications found in many youthful trachomatous patients may be aggravated by a strumous keratitis. He has therefore tried the effect of injecting subconjunctivally a preparation of gold called "Triphal." Injections were made every four or five days and were followed by considerable pain and reaction. A definite improvement was noted in six out of the seven cases treated.

Cuenod and Nataf[8] describe a treatment for trachomatous pannus which they have employed satisfactorily in Tunis for many years. The fornices are ballooned with novocain solution after preliminary cocainization and lavage. The palpebral and bulbar conjunctiva is thoroughly curetted, and then [the affected portion of] the cornea is treated in the same way. This part of the treatment is carefully carried out, working from the periphery towards the centre. The procedure effects a peritomy by dividing the invading vessels. Cyanide of mercury solution is next injected subconjunctivally at the twelve o'clock meridian beneath the area from which the pannus springs. Powdered boric acid is then massaged into the conjunctiva, and this is followed by a lavage of sulphate of copper. Atropine is instilled, copper-camphor ointment is inserted, and a bandage is applied. The article does not mention the strength of the cyanide of mercury nor that of the copper sulphate solutions. A marked reaction with swelling of the lids and chemosis for some days results. During the after-treatment care must be taken to pass daily between the lids and the globe a glass rod smeared with iodoform ointment, in order to prevent the occurrence of symblepharon. Wilson[9] has used chaulmoogra

5 Bakker (C.). Rapport betreffende het onderzoek naar het voorkomen van trachoom bij de school-kinderen te Serang.—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1928. Vol. 68. No. 7. pp. 1082–1089.

6 Solares (Aniceto). El tracoma en Bolivia.—*Medicina Países Cálidos.* Madrid. 1929. Jan. Vol. 2. No. 1. pp. 79–88.

7 Wilson (R. P.). Some remarks upon the Co-Incidence of Tuberculosis and Trachoma, with Notes upon the Treatment of Fleshy Trachomatous Pannus with Gold.—*Bull. Ophthalm. Soc. Egypt.* 1928. Vol. 21. pp. 31–35. [10 refs.]

8 Cuenod & Nataf (Roger). Une méthode de traitement du pannus trachomateux.—*Rev. Internat. du Trachome.* 1928. Oct. Vol. 5. No. 4. pp. 129–132. [2 refs.]

9 Wilson (R. P.). The Treatment of Trachoma with Chaulmoogra Oil.—*Bull. Ophthalm. Soc. Egypt.* 1928. Vol. 21. pp. 27–30. [4 refs.]

oil in the treatment of trachomatous patients attending the Memorial Ophthalmic Laboratory at Giza, and has come to the conclusion that the drug is not a specific for the disease. Application of the oil, however, gives as good a result as that of more commonly used substances. The oil must be rubbed briskly into the membrane.

CORNEA.—*Corneal ulcer.*—PETERSON[10] has found corneal ulcer to occur frequently in China. The ulceration was commonly attended by a poor general nutrition, and gonorrhea was present in about 30 per cent. of the cases. He advocates the use of a large sliding flap as the best form of treatment. He uses mattress sutures to anchor the flap as he found single sutures tend to cut out at too early a stage. Any prolapsed iris is excised and all uveal tissue is freed from the inner edge of the corneal perforation. An optical iridectomy is performed later when required.

ADAMANTIADIS[11] has described a form of groove-like ulceration of the cornea which he observed amongst trachomatous patients who were attacked by a secondary Koch-Weeks catarrh. The ulcer affects the horizontal meridian of the cornea and tends to perforate at its centre ; its edges are remarkably free from infiltration and no hypopyon forms. Prognosis is bad, perforation occurring within two or three days. All the patients were in a debilitated state of health, whilst two of the six recorded cases were over six months pregnant. The author does not appear to have discovered any useful form of treatment for the condition.

LENS.—*Cataract.*—The effect of constitutional disorders in the causation of cataract attracts increasing attention. KIRWAN[12] reports three cases in which he considers malarial attacks have played an important part. Two of these occurred in European women of early middle age. Neither had any family history of cataract and both were otherwise in good health. The third occurred in an Indian male aged 21. The cataract was monocular and there was no history of trauma. The ordinary constitutional causes were absent. Kirwan states " from a large clinical experience of darkroom work in India, I can say that there is no characteristic fundus condition which can be ascribed to malaria."

REEDER[13] reports a case of double cataract which followed a thyroidectomy in a married woman aged 40. Muscular spasms of the extremities followed thyroidectomy and two years later a well advanced cortical cataract was observed in both eyes.

FERRER[14] reports the case of a negro boy aged 16, who, without any apparent cause, developed a rapidly progressive cataract in his right eye. Vision was reduced to perception of light within a period of four months. A year later, the left eye was similarly affected, but the sight of the right eye then began to recover. After eight months' blindness

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10 PETERSON (R. A.). Iris Prolapse from Corneal Ulcer : Treatment by Conjunctival Flap.—*Amer. Jl. Ophthalm.* 1928. Dec. Vol. 11. No. 12. pp. 979–981.

11 ADAMANTIADIS (B.). Kératite weeksienne en sillon chez des anciens trachomateux.—*Ann. d'Oculistique.* 1928. Feb. Vol. 165. No. 2. pp. 119–129. [1 ref.]

12 KIRWAN (E. W. O'G.). Malaria as a Cause of Cataract.—*Indian Med. Gaz.* 1928. Dec. Vol. 63. No. 12. pp. 697–698.

13 REEDER (James E.). Bilateral Cataract following Thyroidectomy.—*Amer. Jl. Ophthalm.* 1929. Feb. Vol. 12. No. 2. p. 122.

14 FERRER (Horacio). Spontaneous Resorption of Juvenile Cataract.—*Amer. Jl. Ophthalm.* 1928. Nov. Vol. 11. No. 11. pp. 886–887. With 2 text figs.

of the left eye, this eye too regained sight. About two years later both lenses were found to have been completely absorbed. The anterior layer of their capsules presented a small opening through which a normal fundus could be viewed. The vision of each eye, with a +11 sphere, was 20–30. The patient lived in an isolated district where no treatment likely to produce such a result was to be obtained.

Morton[15] advocates the omission of an iridectomy when performing intracapsular extraction. He bases his experience on 25 cases and rightly states that this is not a large number on which to base emphatic conclusions. He employs a speculum as a general rule and recommends a careful preliminary training of the patient in movements of the eye. In these respects his experience is somewhat at variance with that of many practised surgeons in India.

Eber[16] reports that he has successfully used the conjunctival bridge flap. He makes his iridectomy on the temporal side of the bridge and assists the delivery of the lens by inserting a forceps beneath the flap. He grasps the lens in the forceps and thus assists its delivery. Irrigation is used to deliver the remaining cortex.

Glaucoma.—Smith[17] considers that the nutrition of the lens and vitreous may depend upon a hypothetical rhythmical action of the ciliary muscle upon the scleral spur. An intense hyperaemia over the ciliary region may re-establish a disordered function of such a mechanism. This would account for the beneficial effect of the subconjunctival injection of cyanide of mercury observed by many in early cataract. Glaucoma is due to an alteration in the nutritive fluid supplied to the vitreous. This induces an oedema of the humour with a consequent advancement of the structures in front of it and an interference with the sluice-like mechanism in the angle of the anterior chamber. He suggests that an intraocular hyperaemia of the secreting mechanism which is associated with the period of low ocular tension following a successful operation, may prove a most important factor in re-establishing the physiological equilibrium of the nutrient mechanism.

Wilson[18] has treated eight cases of glaucoma by intravenous injections of hypertonic saline solution. He finds that (1) It is a most useful procedure for cutting short an acute or subacute attack of the disease; (2) it is an effective and rapid means of reducing a high intra-ocular pressure prior to operation, thus diminishing the difficulty of such an operation; (3) its beneficial effect is transitory only. A saturated solution of common salt was used and not more than 1 cc. per kilo of the bodyweight was injected. Ten minutes was the average time occupied in making the injection. It is necessary to exercise great care to ensure that the fluid flows directly into the vein and that none passes into the surrounding tissues.

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15 Morton (Howard McI.). Intracapsular Extraction without Iridectomy.—*Amer. Jl. Ophthalm.* 1929. Feb. Vol. 12. No. 2. pp. 90–98.

16 Eber (Carl T.). The Conjunctival Bridge in Cataract Operations.—*Amer. Jl. Ophthalm.* 1929. Feb. Vol. 12. No. 2. pp. 106–108. With 3 text figs. [6 refs.]

17 Smith (Henry). The Nutrition of the Lens and Vitreous.—*Indian Med. Gaz.* 1928. Nov. Vol. 63. No. 11. pp. 619–620.

18 Wilson (R. P.). Osmosis in Relation to the Intra-Ocular Fluids and the Application of the Principle to the Treatment of Glaucoma.—*Bull. Ophthalm. Soc. Egypt.* 1928. Vol. 21. pp. 47–50. [4 refs.]

MISCELLANEOUS.—*Cysticercosis.*—BURNIER[19] has reported an intraocular Cysticercus which he observed in an Italian girl, a patient at the Ophthalmic Hospital of Campinas, Brazil. The cysticercus was subretinal and was successfully removed. He has found records of 26 previous cases in the Institute. Only two of these were subconjunctival, the remainder being intraocular. All the cysticerci were diagnosed as *C. cellulosae* and half the patients were present or past hosts of the *T. solium.*

Lysozyme.—RIDLEY[20] in a most interesting paper has recorded his investigations regarding the lysozyme content of the tears. Lysozyme, described by FLEMING in 1922, is an enzyme present in most animal tissues and in many of the secretions, and has the ability to destroy most of the pathogenic bacteria. Its importance, therefore, is very considerable. It is fixed by lecithin and by fats as an adsorption compound, and is probably thus stored in the body. The fact that one gramme of the pure enzyme when dissolved in 100,000,000 gallons of normal saline can produce lysis of a solution of *M. lysodeicticus* gives some idea of its potency. In man it is present in great concentration in the leucocytes, cartilage, tears, nasal mucus, and sputum. White of egg is very rich in the enzyme, its content being twice that of the tears. Ridley's experiments suggest that a considerable fall in the lysozyme content of the tears might enable staphylococci and streptococci to infect an eye which would have been relatively immune had a normal concentration of the enzyme existed. One of his most interesting findings is that a fall of the lysozyme content always accompanies an epiphora lasting more than a few hours. [This is quite contrary to the usual processes of Nature. One would expect her in the ordinary course to mobilize all possible defences against attack, and the increase of the physical means of protection at the expense of the chemical appears unusual. Exhaustion of the enzyme content of the lachrymal gland affords a possible explanation.] Keratomalacia due to vitamin A deprivation is accompanied by a deficiency of the enzyme, and its onset may be delayed by the instillation of normal tears. [This suggests that instillations of egg-white solution might prove useful in this disease. Irritant drugs certainly prove positively injurious.] In phlyctenular disease and in interstitial keratitis a fall in the lysozyme titre of both eyes usually occurs even though only one eye is diseased. The author suggests that the beneficial action of atropine in many eye diseases may be due to a diminution of epiphora owing to the action of the drug upon the lachrymal gland and to the consequent increase of lysozyme in the tears. The paper is important and deserves to be read in the original. Also, it serves to demonstrate how very important it is, when treating any disease of the eye, to search thoroughly for any constitutional defect the treatment of which might serve to increase the lysozyme content of the tears or otherwise to strengthen the natural defences of the body.

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[19] BURNIER (J. Penido). Cysticercose ocular. 27a observação do Instituto Ophtalmico de Campinas.—*Brasil-Medico.* 1928. Dec. 22. Vol. 42. No. 51. pp. 1424–1427. [13 refs.]

[20] RIDLEY (Frederick). Lysozyme: an Antibacterial Body present in Great Concentration in Tears, and its Relation to Infection of the Human Eye.—*Proc. Roy. Soc. Med.* 1928. July. Vol. 21. No. 9. pp. 1495–1505 (Sect. of Ophthalm. pp. 55–65.) With 2 text figs. [8 refs.]

Effect of Ultra-Violet Light.—The observations of W. S. and P. Duke-Elder[21] regarding the action of short-wave light upon the structures of the eye, have an important bearing on the work of the ophthalmologist in the Tropics. Rabbits were employed for the experiments. "The dose of light, while considerably above that which may be used clinically, was not greatly in excess of it." In addition to the well recognized lesions of the conjunctiva and cornea, changes occurred in both the capsular epithelium and the lens substance. The epithelial cells showed very definite signs of injury, and the capsule itself became swollen in places and lost the histological definition of its outline. Throughout a very thin subcapsular zone, mild degenerative changes, too, could be detected in the lens fibres. The authors concluded that ultra-violet radiations cannot be exonerated from a share in the aetiology of cataract. Nor was the retina found to be entirely free from damage. Ganglion cells showed vacuolation with bleaching and disintegration of chromatins. These changes were most evident in the region of the posterior pole of the eye.

Reports.—The [22]Giza Memorial Ophthalmic Laboratory was fully completed in the beginning of the year 1927, and its second annual report amply proves how great was the need in Egypt for such an institution. Post-graduate instruction, routine pathological examinations, the special examination of clinical cases, and research work are all included in the work of the laboratory. 496 pathological specimens were examined, and the report contains microphotographs of some of the more interesting of these. Amongst them is the case of schistosomiasis of the conjunctiva which was referred to in the last article (this *Bulletin*, Vol. 25, p. 990); also a cysticercus cyst of the orbit. 1,367 special clinical examinations were made—379 being by the slit-lamp. Research on trachoma, which disease is stated to affect 90 per cent. of the Egyptian population, was actively pursued; and an organism, said to be either identical with or very similar to that isolated by Noguchi from trachomatous Albuquerque Indians, was successfully cultivated. Chaulmoogra oil was found to have no specific action in the disease and gave no better results than the ordinary methods of treatment. Intravenous injection of hypertonic saline solution (30 per cent.) was found useful in aborting an acute attack of glaucoma. From 30 to 55 cc. was injected and the consequent reduction in ocular tension diminished the difficulties and dangers of an operation. The benefit is, however, only temporary and such a form of treatment is therefore of no value in chronic glaucoma.

Steady progress is the keynote of the [23]1926 Report of the Ophthalmic Section of the Government of Egypt. More hospitals have been instituted, 15 per cent. more patients have been treated, and the number of persons found to be blind in one or both eyes has diminished. Acute ophthalmias, of which the gonococcus is stated to be by far the most common cause, account for over 74 per cent. of the blindness met

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21 Duke-Elder (W. S.) & Duke-Elder (P. M.). A Histological Study on the Action of Short-Waved Light upon the Eye, with a Note on "Inclusion Bodies."—*Brit. Jl. Ophthalm.* 1929. Jan. Vol. 13. No. 1. pp. 1–37. With 10 text figs. & 2 plates (1 coloured). [6 pages of refs.]

22 Egypt: Ministry of the Interior. Department of Public Health. Second Annual Report of the Giza Memorial Ophthalmic Laboratory Cairo 1927. [Wilson (Rowland P.), Director.]—53 pp. With 22 figs. (4 coloured). Cairo.

23 Egypt: Ministry of the Interior. 14th Annual Report of the Ophthalmic Section, 1926.

with. The course of these acute ophthalmias is said to be very rapid and destructive. The treatment adopted is painting with 2 per cent. nitrate of silver and frequent irrigation with eusol lotion. Repeated rubbings with 1 per cent. perchloride of mercury solution after a preliminary expression operation appears to be the recommended treatment for trachoma occurring in schools. The comparative infrequency of operations for senile cataract is rather striking. Out of a grand total of 140,788 operations only 1,509 were performed for senile cataract. 345 cases of soft cataract were seen as compared with 4,595 of senile cataract and 16 of lamellar cataract. 3,617 cases of primary glaucoma, and 5,711 of secondary glaucoma were met with.

The [24]Annual Report by P. H. HENNESSY of the Ophthalmic Department of the Ipoh Hospital for the year 1927, shows a steady increase in the daily number of attendances; the total number of these was 11,546. The in-patients numbered 505. Conjunctivitis was the most frequent disease met with, and accounted for 2,121 cases, gonorrheal ophthalmia for 44 and trachoma for 374. Chinese immigrants were principally affected by this latter disease. 142 cases of cataract were admitted.

The [25]Annual Report of the Ophthalmic Department of the General Hospital, Kuala Lumpur, for the year 1927 shows that very similar conditions exist in that district. A. VISWALINGAM found catarrhal ophthalmia particularly prevalent between April and May, and August and September. A mixed infection of Koch–Weeks and Morax–Axenfeld was the ordinary cause. Keratomalacia was met with fairly commonly amongst young, ill-nourished children. The Report deplores the mischief which is worked by quacks amongst the ignorant coolies. This is a common complaint in the East.

H. Kirkpatrick.

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24 HENNESSY (P. H.). Annual Report of the Ophthalmic [Department] of the Ipoh Eye-Clinic for the Year 1927.—*Federated Malay States Ann. Rep. Med. Dept. Year 1927.* Appendix K. pp. 133–136.

25 VISWALINGAM (A.). Annual Report of the Ophthalmic Department, General Hospital, Kuala Lumpur, for the Year 1927.—*Federated Malay States Ann. Rep. Med. Dept. Year 1927.* Appendix L. pp. 137–141.

REVIEWS AND NOTICES.

MAXWELL (James L.) [M.D., B.S., London, Major, late R.A.M.C., Medical Superintendent, Tainan Mission Hosp., Formosa, 1901–1923, etc.] **The Diseases of China including Formosa and Korea.** (JEFFERYS & MAXWELL). Second Edition. pp. ix+530. With 176 illustrations. 1929. Shanghai. [£1.]

The large section of the profession whose interests lie east of Suez will welcome the appearance of the second edition of " The Diseases of China," by Dr. James L. Maxwell of Shanghai. The first edition, which was published over twenty years ago under the joint authorship of JEFFERYS and Maxwell, has become a classic in medical literature, because it was the first, and has remained the only attempt to make a systematic study of the diseases prevalent in China. In the interval, the senior author has retired from active work in the Far East, and Dr. Maxwell who, as Secretary to the China Medical Association and editor of the *China Medical Journal*, has had unique opportunities for instituting a survey of the medical activities of such a vast territory, has worthily completed the necessary task of revision.

The introductory chapter gives an excellent account of the ancient empirical art of medicine in China and will be read with interest and astonishment by all students of ethnology. The pharmacopoeia of China is enormous and is chiefly of vegetable origin, though inorganic products are also used, and drugs of animal origin sometimes give play to remarkable practices. " A favourite remedy for sore throat in parts of the country is to swallow a live cockroach in honey."

The greater part of the volume is devoted to medical diseases and here the author's long experience in various Chinese hospitals, is shown to full advantage. In the chapter on Acute Infectious Diseases he has unfortunately decided to omit all reference to small-pox, a disease which is noted, in his nosological reports, as universal in China, and responsible for a heavy mortality. A description of the striking clinical pictures, which are nowadays probably unparalleled in any other part of the world, would have proved an important contribution to medical history.

In all the diseases dealt with, the treatment suggested has been brought thoroughly up-to-date, but, as is noticeable in some of the therapeutic measures recommended, long residence in the outposts of professional practice, leads naturally to a certain amount of dogmatism. For instance, in dealing with Malaria he states : " It is quite a mistake to suppose that the amount of quinine need be large ; . . . in nearly all cases of fever, grs. iiss. of quinine three times a day is ample." " To the use of intramuscular injection, unless in very exceptional circumstances, we are entirely opposed." It is obviously an oversight that in the treatment of blackwater fever, he advises that " Quinine should certainly be administered, and by preference *hypodermically*, in all cases showing malarial parasites in the blood."

Part III deals with surgical diseases, and demonstrates in telling fashion the enormous variety of surgical material available in a population of four hundred millions. The problems which confront the surgeon in China are not due to any unusual pathology ; they seem to be rather the result of a degree of neglect unknown in Europe.

The moderate cost of this volume was only possible by arranging for its production in China ; taking this fact into consideration the printing and the binding are admirable. The new edition will take an important place as a work of reference for all tropical physicians, and for those who are about to enter upon a professional career in the Far East, it should be an invaluable guide.

J. Anderson.

CHOPRA (R. N.) [M.A., M.D., (Cantab.), Major I.M.S., etc.] & CHANDLER (Asa C.) [M.Sc., Ph.D., Professor of Biology, Rice Institute, Houston, Texas]. **Anthelmintics and their Uses in Medical and Veterinary Practice.**—pp. xii+291. With 65 figs. on 5 plates. 1928. London: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, W.C.2. [22s. 6d.]

This volume represents a first endeavour in medical literature to give a connected account of anthelmintics. Under each drug the authors attempt to give all the available information on the chemical nature and relationships of the drugs, their history, their physiological effects and their toxicology and contraindications. The various preparations are referred to and the various methods of administration are described and their relative efficacy discussed. The text is divided into three sections, viz.: (1) General considerations; (2) Anthelmintics acting upon parasites in the gut; (3) Anthelmintics used against somatic infections. Section I deals generally with methods of administration and discusses the value of preliminary preparation; the methods of administration of the drugs; the value of post-purgatives; the criteria of cure; the choice of an anthelmintic and the experimental investigation of anthelmintic drugs. A paragraph is devoted to consideration of the vermicidal effect of elevated temperatures and a word of caution is uttered regarding the possibility of applying the results of RIVAS' experiments to man. A chapter entitled Helminthological Considerations gives a cursory account of the chief worm infections of man and stock for which drug treatment is desirable. This chapter contains a synopsis of the commoner and more important forms, including their eggs and larvae. It is doubtful if the ordinary reader could safely apply this differential table to the diagnosis of the various infections without more adequate information or instruction in the technique and terminology of the subject, and he will probably pass on with greater interest to the succeeding chapter which deals with the correlation between chemical composition and anthelmintic action. This fascinating study is of recent origin and dates from the work of HALL and WIGDOR in 1917–18. It has been shown that with the introduction of a hydroxyl group into naphthalene, benzene and paracyamine vermicidal properties are conferred on these substances producing respectively beta-naphthol, phenol and thymol. This is further emphasized by the fact that when these phenolic compounds are esterified their vermicidal effect is entirely lost. Further studies show that there are several factors and chemical groups to which the anthelmintic action of a drug can be attributed and no common denominator can be found in dissimilar drugs having an anthelmintic action.

In Section II a systematic account is given of the anthelmintics acting on cestodes and on nematodes in the gut; the treatment of intestinal flukes is the same as for ankylostomiasis.

In Section III the antimony compounds and emetine come under consideration owing to their specific action against somatic parasites which are also in some cases susceptible to the action of ordinary anthelmintics.

There are certain inconsistencies in the text which will probably disappear in a succeeding edition. Thus on p. 168 under cautions and contra-indication "It is advisable not to give santonin on an empty stomach" faces an account on p. 169 of the special method successfully followed by the authors in many cases in which "The patient is given his last meal at 5 p.m., no food being allowed after that . . . At 10 p.m. 3 grains of santonin . . . is administered."

The volume ends with a bibliography, which, so far as it goes, will prove useful to those interested either in the theoretical considerations or in the practical applications dealt with in the text. Medical Bibliography is, however, notoriously inaccurate and the present contribution requires revision. Trouble would be saved to subsequent workers if citations were verified from the originals and not merely copied from other works.

R. T. Leiper.

Fülleborn (F.) [Dr. med. et phil. nat. h. c.] **Filariosen des Menschen.** [Human Filariasis.]—*Handbuch d. Path. Mikroorganismen.* 1929. Lief. 28. Vol. 6. pp. 1043–1224. With 77 text figs. & 3 plates (2 coloured). [18 pages of refs.] Jena: Gustav Fischer; & Berlin & Vienna: Urban & Schwarzenberg.

Those who heard Professor Fülleborn lecture recently at the London School of Hygiene and Tropical Medicine, will turn with anticipation to *Filariosen des Menschen*, which essentially constitutes a monograph with 77 figures, 3 plates of which 2 are coloured, and nearly 200 pages of text of which about a tenth are filled with references. The literature is fully and generously cited and, to leave two grumbles behind once and for all, it should be said that Fülleborn has not been backed by his press reader as closely as his careful work deserves—witness "Patrik" Manson three times, Warrington "York" twice, "Loos" and Th. "A" Bancroft once, as well as slips in less well-known names. Moreover, zoological names are printed in ordinary type, a matter of regret at least to English readers.

Passing on to what really matters, the preliminary remarks with which the subject is introduced include a valuable illustrated table bringing out the main points in the biology of the most important filariae. Technique concerns itself chiefly with microfilariae and stresses the importance of exactness. For them a standard means of preparation is essential owing to their variation in size according to their degree by contraction—active when they are alive, passive when they have been killed and preserved in different ways and for different times. Measurements which omit this information are of slight value. For accurate counting there must be a square field and a fixed quantity of blood. Yet all such precautions are too commonly disregarded by helminthologists.

The structure of microfilariae as disclosed by different stains is clarified by the coloured plates. The numbers of embryos which have been recovered after death from various organs and tissues are tabulated. The latter point leads naturally to the consideration of periodicity, which is held to be a question of the site occupied by the mass of microfilariae at a given moment. When absent from the skin they cannot, it is pointed out, be maintaining themselves in the arteries, for they have no mechanism by which they could anchor themselves there. But in the capillaries they can it is held, do so by taking up a slightly bent attitude, so holding themselves fixed against the force of the blood stream—as did Tom the Water-Baby against gravity whilst he was still an old-time chimney sweep, and as do climbers in rock clefts to this day. That which induces this suggested tone in the larval muscles is held to be a reciprocal interreaction between host and parasite caused by some chemical substance. If so we must, it seems, conclude that it will during the night lock up *Mf. loa* but set free *Mf. bancrofti* in most countries, but leave unaffected the latter in Fiji and *Mf. perstans* in all places—provided it is the same substance which affects or does not affect them all.

As will be expected, the insect phase is clearly described. It is illustrated by striking drawings and microphotographs. For producing pathological effects the chief place is given to lymph stasis (brought about essentially by adult stages, but with the larvae not necessarily out of the picture) with bacterial infection superadded.

In a special section the individual filaria species are individually and fully considered. Their present zoological names are unequivocally stated in the early pages, but through the rest of the article Professor Fülleborn has conveniently preferred to retain the genus *Filaria* in its broad sense. The monograph is full of dependable material, little of which has been mentioned, but from this many will profit, some with due acknowledgment, others doubtless without, since such disregard is too apt to be the fate of those who ungrudgingly place their treasures at the disposal of their fellows.

Clayton Lane.

DYAR (Harrison G.) [A.M., Ph.D., Custodian of Lepidoptera, U.S. National Museum]. **The Mosquitoes of the Americas.**—616 pp. With 123 plates. Carnegie Institution of Washington Publication No. 387. 1928. May. [Paper cover $.5.00 : Cloth binding $6.00.]

This is a sort of critical supplement, or epitomized revision, of the great monograph by HOWARD, DYAR, and KNAB of the *Mosquitoes of North and Central America and the West Indies*, which was reviewed some years ago in this *Bulletin*, the first instalments in Vol. 8, p.68, and the last in Vol. 10, p. 310. The scheme of that work does not embrace the South American continent ; in the present volume that deliberate defection is compensated. Again, in the earlier monograph most of one large volume is devoted to anatomical and biological detail, to the part played by mosquitoes in the continuance and spread of diseases caused by specific microparasites and to the economic damage thus occasioned, and also to the various methods employed for the restraint and destruction of mosquitoes : all those things there stand apart in a sort of historical whole, and therefore in the present purely entomological supplement none of them is separately discussed, although appropriate but brief and circumspect notice is taken of them in the definitions of tribes and genera and species. In the earlier monograph the Culicidae are distributed in three subfamilies—Culicinae, Corethrinae, and Dixinae—in accordance with the views of that discriminating naturalist WILLISTON ; that arrangement is assumed in the present work, which also deals exclusively with the subfamily Culicinae. There, again, the Culicinae are disposed in two tribes—Sabethini and Culicini—the latter being further subordinated in four legions, headed severally by Culex, Dinocerites, Megarhinus, and Anopheles. Here, however, the precedence of the Sabethini and the phyletic distinction of Dinocerites are not so strongly asserted, and the Culicinae are at once distributed in 5 tribes—Sabethini, Culicini, Uranotaeniini, Megarhinini, and Anophelini.

The five tribes are rather informally defined in the course of the book, but their bare recognition characters are stated, along with those for recognition of their constituent genera, in a common preliminary key, or synoptic table, the verification of which requires careful microscopic examination of localized setae. The system, as the author allows, is difficult. For the ordinary medical man whose interest is limited to the mosquitoes that may come within the professional circuit, a system that has to be interpreted by critical examination of setae is too refined and technical ; moreover the specimens that are sent to him for identification too often are not suitable for its interpretation. This criticism is not meant to disparage the author's classification, which is also based upon—and is brought in harmony with—study of the larvae ; it is merely meant to emphasize the point that the medical man who turns to this book for practical purposes must also be a persevering and well-equipped entomologist.

Of the classification as a product of combined science and art, it must be said that it is a worthy piece of work, though weak on the artistic side, since the definitions of tribes, though freely descriptive, do not include a separate and conspicuous enumeration of all the tribal characters—do not, in short, give the reader a perfectly clear impression of the precise signification of the tribal name. On the scientific side, one can only say, therefore, that the life of a zoological classification depends upon what its author takes to be ultimate zoological characters, and that on this account, to the unprejudiced zoologist, all natural classifications are matters of opinion and must always reside between the endless jar of conflicting opinions. The author's classification has the merit of insisting on the value of larval characters, but is not quite free from the common weakness of allowing a single character, or some particular dissimilarity, to outweigh a large number of common similarities. This latter defect appears in giving tribal rank to Uranotaenia. Another matter of opinion is the inclusion in the Culicini tribe of all the scaly, brilliant, tree-hole-breeding forms of

" Culicini "—one would like to see them distinguished from the Culex type.

The author recognizes 23 genera of Culicinae in the New World, namely, 1 each of Anophelini, Megarhinini, and Uranotaeniini, and 10 each of Culicini and Sabethini. One may note, as one of the inevitable consequences of the riot that followed the discovery of the pathogenous import of mosquitoes, that 93 of the ephemeral " genera " that strutted and fretted upon the stage between the years 1901 and 1910—not to speak of 17 of later, chastened years—here are lighted the way to dusty death, 21 disappearing under Culex, 42 under Aëdes, and 30 under Anopheles.

For discrimination of species the author not only draws upon the usual adult characters but uses also—as far as present knowledge permits—characters furnished by the male hypopygium and by the larva ; so that for preliminary determinations there are for the constituents of each genus three separate keys—one for each kind of attributes.

The definitions for the exact diagnosis of species, which also take the larva into account, are admirably concise and sententious. A special feature of these definitions—as also of the definitions of genera and tribes—and a feature that should please the inquirer who is an entomologist by force of circumstances, is their broadly informative character. Thus, to take examples of the method : in the definition of the Sabethini the recognition characters of the tribe are described in a few words, while an interesting account is given of their breeding places in the moisture held among plants, and of their predaceous larvae, and among other things the useful information is added that they are economically negligible, since only occasionally may they bite man, and many species feed exclusively upon reptiles. Again, in the definition of the Caribbean sea-shore genus Dinocerites, which with its three synonyms is now included in the Culicini and derived from Culex, the much elongate antennae, which are characteristic, is the only structural feature mentioned in a definition consisting of peculiar facts of distribution, habits, breeding-places, and biting propensities. Once again, exactly half the definition of the species known of old as " *Stegomyia fasciata* " is occupied by biological and historical information at once comprehensive and concise. The author is now confident in the belief that this species " is doubtless a native of Africa, and was brought to America in the early days, perhaps by Columbus himself " ; and in support of the argument of an Old World origin he brings out the cogent facts that whereas in the tropics of the Old World there are many species of the subgenus Stegomyia and also many other forms approaching the Stegomyia type, there exists in the New World only this one particular species and nothing else that even approaches the Stegomyia type. It is not amiss to notice, as a good illustration of the process of straining at a gnat, that the synonymy of this species here includes twenty-eight names for the same thing, and that the first four on the list are *Culex aegypti* Linnaeus 1762 ; *Culex argenteus* Poiret 1787 ; *Culex fasciatus* Fabricius 1805 ; *Culex calopus* Meigen 1818.

The work is illustrated by 123 plates, the first of which explains in semi-diagrammatic fashion the foundations of the author's scheme, namely, the topography of the pleural setae, the structural detail of the hypopygium, and the indicative features of the larvae ; all the rest show the various specific modifications of hypopygium and significant larval structures that occur throughout the subfamily.

A. Alcock.

STITT (E. R.) [M.D., Sc.D., LL.D., etc.] **The Diagnostics and Treatment of Tropical Diseases. A Compendium of Tropical and Other Exotic Diseases.** 5th Edition.—Revised.—pp. xix+918. With 249 illustrations. 1929. London : H. K. Lewis & Co., Ltd. [31s. 6d.]

Few will at first glance recognize in this large, well bound, well printed volume, the fifth edition of Stitt's well known handbook of Tropical Diseases.

It will be hailed as having risen to Text Book rank and, to quote the subtitle, as a " Compendium of Tropical and other Exotic Diseases " it will find its way on to the shelves of all American practitioners in the tropics. Diseases are grouped into eight sections : (i) Diseases due to Protozoa ; (ii) Diseases due to Bacteria ; (iii) Diseases due to Filterable Viruses and Rickettsias ; (iv) Nutritional Disorders ; (v) Diseases of Uncertain Etiology ; (vi) Those due to Fungi and Poisonous Plants ; (vii) Animal Parasites, including Helminths, Arthropods, Fish, Snakes, etc., ; (viii) a chapter on Problems of Medical and Surgical Practice in the Tropics, with four appendices : (*a*) an Index of Clinical Diagnosis, (*b*) Laboratory Procedures, (*c*) an Index of Laboratory Procedure, (*d*) Tropical Hygiene.

The last mentioned in some 70 closely printed pages contains a lot of interesting information ranging over climate, physiological considerations, clothing, food, dietaries, water, sewage disposal, disease prophylaxis, etc. Laboratory procedures cover 100 pages and form an epitome of the companion volume by the same author on bacteriology, blood work and parasitology. A very wide field is covered, from the preparation of all culture media, indicators, standard reagents, syphilitic antigens to blood grouping and the estimations of acid-base equilibrium, from the examination of urine, faeces and blood to methods of visualization of the gall bladder. Many may doubt the advisability of including such a section in a text book of tropical medicine; its use, I venture to suggest, will be rather to give to the tropical student and practitioner a means of understanding what his brother tropical pathologist, who will be using his own text books, is doing. It may also stimulate the practitioner to undertake more practical laboratory work. This section contains also very useful tables of anatomical and physiological normals, while under the Laboratory Index against each disease or symptom are given the investigations to be undertaken for its elucidation. In the same way in the Index of Clinical Diagnosis (54 pages) are given main symptoms and the method of making a differential diagnosis. There is no systematic description of parasites and vectors but each is dealt with shortly under etiology of each disease in the main body of the book.

Having indicated the scope of this very valuable addition to the text books of tropical medicine and it being impossible to deal with the subject matter in greater detail, the following criticisms are offered. As mentioned above the author has grouped diseases under sections ; any such method may have advantages but is bound to have also disadvantages ; the advantages would have been equally gained by position of chapters while such disadvantages as the inclusion of the diseases due to spirochaetes (treponemes) under the protozoal section and the divorce of amoebic and bacillary dysentery from one another could have been obviated.

The author, influenced by workers in Haiti, has elected to accept the evidence in favour of the identity of yaws and syphilis, which in the present state of our knowledge seems unwise. He then describes yaws shorn of some of its well known characteristics but clothed in rather unusual garb, decked out with visceral lesions, hepatic gummata, aneurysms and cerebral haemorrhage. The text bears evidence of rather hasty compilation and critical analysis reveals numbers of minor omissions and little inaccuracies and some looseness of expression. After such a statement it is only fair to give examples of these blemishes which will no doubt disappear in subsequent editions. Secondary yaws lesions on the trunk are said to be rare, which is not true. Under amoebiasis no reference is made to splenic abscess. Again no proper recognition of Egyptian splenomegaly, the splenomegaly of bilharziasis, is made. Also in the ' Table of Parasitic Infections of Man ' (p. 630) arranged under different parts of the body—blood to vagina—the spleen finds no place. A plan has been followed in each chapter of giving a rather long ' definition ' followed by ' symptomatology ' and then ' symptoms in detail ' with the result that there is much unnecessary repetition and the several accounts do not always agree. Thus under Typhus : " The eruption first appears about the fifth day "—symptoms in detail on the opposite page " Eruption : This first appears about the fourth day."

One might also mention that geographical distributions are not always correctly given. The illustrations, especially the photographs and micro-photographs, show a great improvement on those in the previous edition but some of the drawings are still rather crude and it is a pity no scale or note of magnification is given with all illustrations.

H. S. Stannus.

Aalsmeer (W. C.) & Wenckebach (K. F.). **Herz und Kreislauf bei der Beri-beri-Krankheit.** [Heart and Circulation in Beriberi.]—81 pp. With 1 text fig. & 2 plates. 1929. Urban & Schwarzenberg. Berlin N 24, Friedrichstrasse 105 b; Vienna, 1, Mahlerstrasse 4. [Mks. 8].

No satisfactory explanation has yet been given either of the sudden heart failure so common in beriberi or of the dramatic cure brought about by administration of vitamin B. In this monograph an attempt has been made to solve these problems. In the first part Dr. Aalsmeer, as the result of seven years' work in Java, describes the clinical findings in slight, moderate and severe cases of beriberi. Very complete clinical details are given of the cardiac symptoms together with observations on blood pressure, X-rays of the heart and cardiographic tracings. The leading features of the beriberi heart are dilatation and weakening of the right ventricle, weakening of the left ventricle, increasing stasis in the liver and venae cavae and a normal pulmonary circulation except immediately before death when stasis and oedema develop. There is never any irregularity of the heart nor extrasystole. The electrocardiogram shows no disturbance of stimulus conduction. There is, however, a greatly increased resistance to the electrocardiogram.

In the second part of the monograph Professor Wenckebach discusses the beriberi heart from the theoretical standpoint. He believes that the main feature is the failure of the right heart, characterized by engorgement in the liver and venae cavae. Why this engorgement may not rather be due to failure of the left ventricle is unexplained. More agreement will be found with the suggestion that in beriberi there is increased water retention by the tissue colloids, more especially those of the heart and striated muscle. In the frog's heart immersed in water the rate of conduction is increased and the atrio-ventricular interval is shortened. Similar findings are recorded in severe cases of beriberi.

G. M. Findlay.

Far Eastern Association of Tropical Medicine. **Transactions of the Seventh Congress held in British India, December, 1927.** [Edited by Lt.-Col. J. Cunningham, C.I.E., B.A., M.D., I.M.S., Director, Pasteur Institute of India, Kasauli, British India, General Organizing Secretary for the Seventh Congress.]—Volume I. pp. xl+865. With 61 plates (4 coloured) & numerous figs., charts & maps. Published for the Seventh Congress by Thacker's Press & Directories, Ltd., 6, Mangoe Lane, Calcutta.

This large volume is the first of three in which the papers read at the Seventh Congress of the Far Eastern Association of Tropical Medicine are to be given to the world. The Editor notes that the Transactions of the Congress of 1912 occupied a volume of 399 pages, and that in 1925 two volumes were required. One wonders to what the Transactions will grow in another ten years. The subjects contained in this volume are: Medicine and Dermatology; Pathology; Surgery; Ophthalmology; Gynaecology and Diseases of Pregnancy; Mental Hygiene and Psychiatry; Radiology; Dentistry; State Medicine; General and Special Hygiene;

Maternity and Child Welfare, and are those comprised in the first two of the six Sections of the Congress. Eighty-seven papers are here printed, the great majority in English, a few in French. A bare mention of their subjects would be tedious. Some of the more interesting will be noticed in the appropriate place in this *Bulletin* and the *Bulletin of Hygiene*.

A. G. B.

Wu Lien Teh [M.D., B.C. (Cantab.), M.D. (Tokio), Director & Chief Medical Officer of the Service, etc.] [Edited by]. **Reports 1927-1928. North Manchurian Plague Prevention Service. Being Volume VI of the Series.**—pp. vi+350. With 71 figs. (2 coloured.)

This Report contains about forty separate articles not all of which refer to plague since they include articles on Cholera in China and Japan and chapters on Tuberculosis and Scarlet Fever. Most of the papers have appeared in medical journals and have been noticed in this *Bulletin*. The Report even includes a short autobiography of the Editor, Dr. Wu Lien Teh, who, as is well known, has done much good work in Manchuria especially in connexion with pneumonic plague in man, and experimental pneumonic plague among rodents. This form of plague is at times a terrible scourge in Manchuria and only a few years ago more than 70,000 people died in one epidemic. During the two years that have elapsed since the publication of Volume V of these reports the staff of the prevention service has had a fairly quiet time as serious epidemics were absent until the end of the summer of 1928 when there were outbreaks of bubonic plague in Outer Mongolia, Shensi, Shansi and the newly opened-up regions of Fengtien Province. The epidemic was in the hands of the personnel of the prevention service and the outbreak was localized and suppressed at the cost of 500 lives and thirty thousand dollars. Plague among wild rodents especially among the tarabagans is exhaustively treated in a paper reprinted from the *Amer. Jl. of Hygiene* 1928. The article on recent knowledge of pneumonic plague by Wu Lien Teh is published for the first time. It is compact and interesting but contains nothing that is new. Among the chapters dealing with other diseases and conditions is one on "Biological Investigations among Aboriginal Tribes in North Manchuria," with 22 very good photographic illustrations, written by H. M. Jettmar. The problems of cholera and tuberculosis are much the same in China as in other parts of the East.

J. H. Tull Walsh.